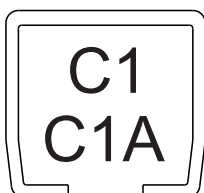


CABLE TROLLEYS AND ACCESSORIES FOR C1 (C1A) RAILS



C1-06 2024

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Main design rules for mobile receivers supply systems

Cable trolleys are intended to work at normal conditions: indoor / open air.

Cable trolleys supply lines can be also applied at especially hard working conditions like:

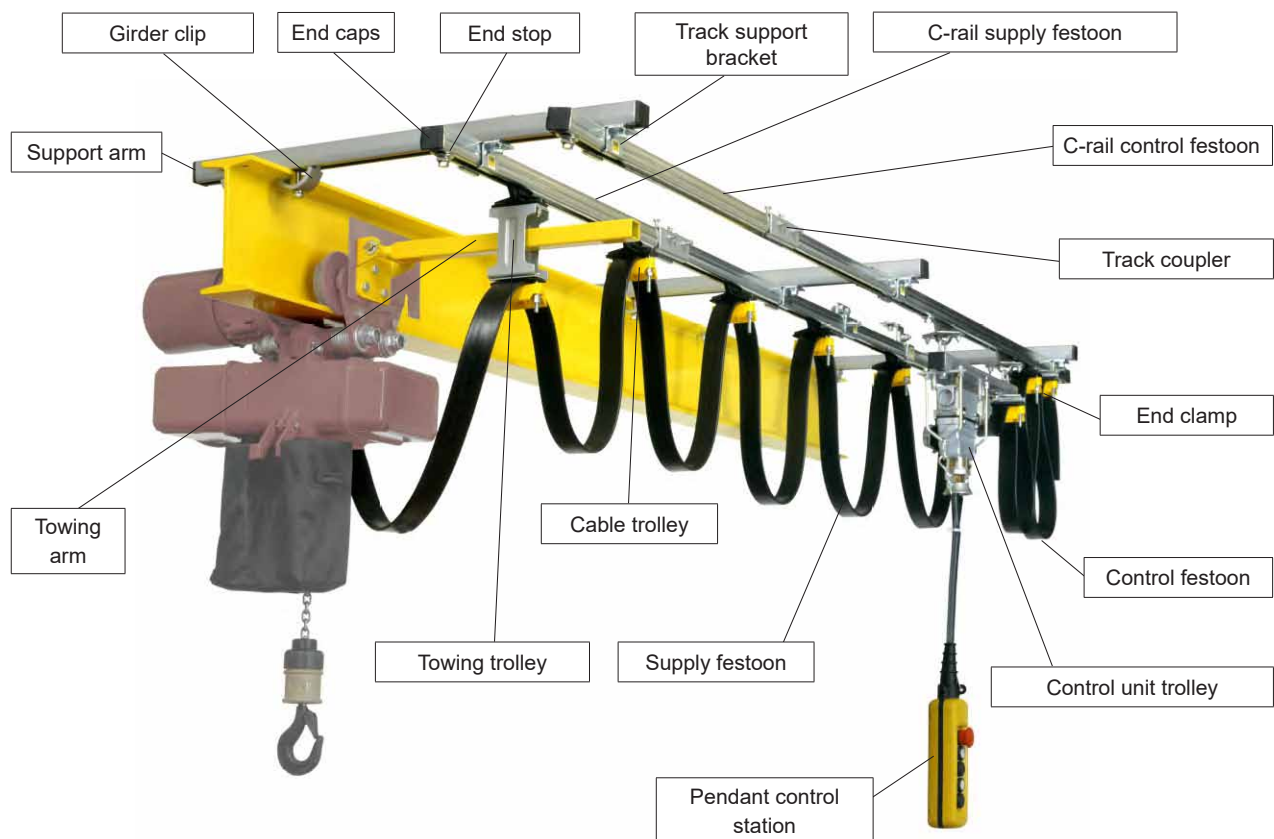
- aggressive environment,
- heat radiation,
- high humidity,
- dusty, explosion hazardous area.

In that case, please ask us for develop an appropriate technical solution.

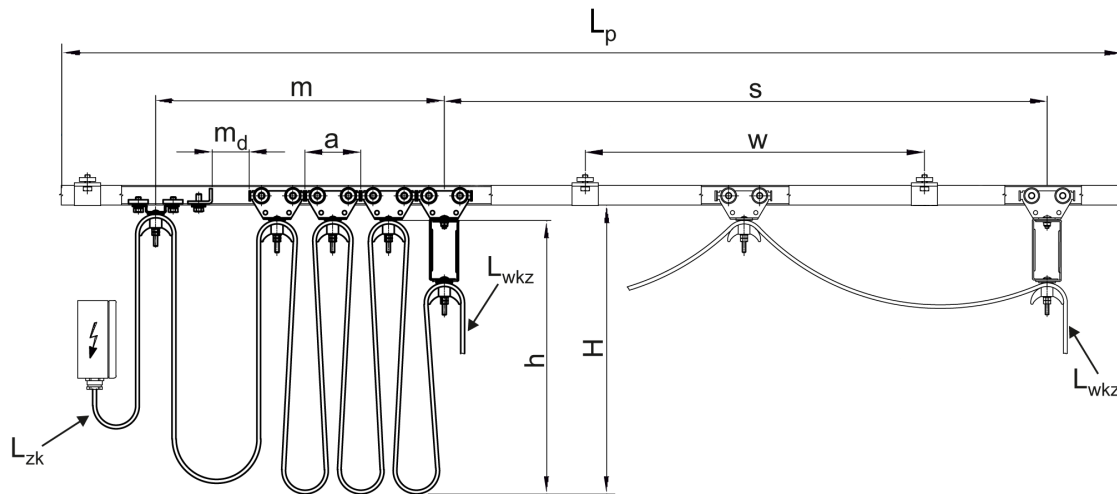
When designing the power system must include provisions to prevent accidents!

UNILIFT reserves the right to make design changes.

Components of supply C-rail system



C-rail power supply system selection

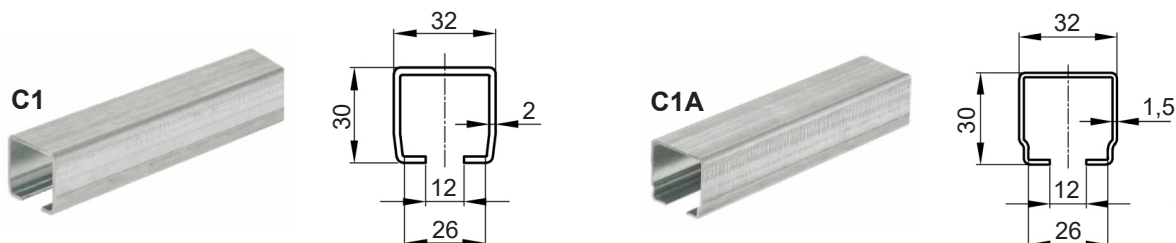


DESIGNATIONS:

s	length of towing trolley route [m]
a	cable trolley length [m]
z	number of cable trolleys
n	number of loops
h	cable loop height $h_{max} = 0,3 \times \text{curve radius } R$
H	permissible height of cable loop [m]
m	length of trolley storage area [m]
md	trolley storage area length addition: $m_{d min} \geq a$ [m]
f	cable length addition coefficient $f = 1,1 \div 1,2$
D	cable support diameter [m]

L_p	length of the C-rail guide track [m]
L	length of supply wire from middle of the end clamp to middle of the towing trolley [m] without connecting sections L_{zk} and L_{wkz}
L_{zk}	cable length from end clamp to crane contact box [m]
L_{wkz}	cable length from towing trolley to actuator contact box [m]
L_c	total cable length [m] with connecting sections L_{zk} and L_{wkz}
w	distance between the track support brackets - depending on the capacity per unit length. In practice this is: - straight line - from 1,5 to 2,0 [m], - sections curved - from 1,0 to 1,2 [m]

RELATIONS:	FORMULAS:
Number of loops	$n = \frac{f \times (s + m_d)}{2h - f \times a + 1,25D}$
Number of trolleys (without towing trolley and end clamp)	$z = n - 1$
Length of trolley's storage area	$m = n \times a + m_d$
Length of supply wire (without connecting sections L_{zk} and L_{wkz})	$L = f \times (s + m)$
Total length of supply wire (with connecting sections L_{zk} and L_{wkz})	$L_c = L + L_{zk} + L_{wkz}$

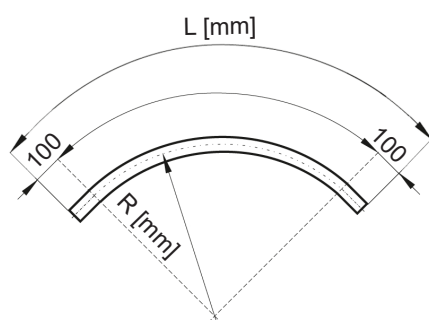
RAILS AND ACCESSORIES
1 Rails


cold formed Sendzimir galvanized steel PN-EN 10327						stainless steel 1.4301		acid resistant steel 1.4571	
Catalog №	Type	Length [mm]	Static quantities*		Weight [kg]	Catalog №	Type	Catalog №	Type
			I_x [cm ⁴]	W_x [cm ³]					
1000.10	C1/6	6000	2,4	1,4	1,49	1000.10 -N**	C1/6 -N**	1000.10 -K**	C1/6 -K**
1000.11	C1/4	4000	2,4	1,4	1,49	1000.11 -N	C1/4 -N	1000.11 -K	C1/4 -K
1000.15	C1/3	3000	2,4	1,4	1,49	-	-	-	-
1000.20	C1A/6	6000	1,9	1,1	1,10	1000.20 -N**	C1A/6 -N**		
1000.21	C1A/4	4000	1,9	1,1	1,10	1000.21 -N	C1A/4 -N		
1000.25	C1A/3	3000	1,9	1,1	1,10	-	-		

*

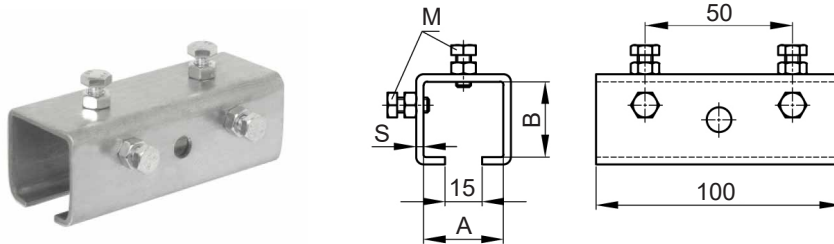
I_x	- axial moment of inertia [cm ⁴]
W_x	- axial section modulus [cm ³]

** C1/6 -N, C1A/6-N i C1/6-K on request

2 Rails - curve sections

Curve sections - on request.

 Min. bending radius $R = 750$ [mm].

 To perform the C-rail curve section, please attach a picture (drawing) of curve track with all necessary dimensions: bending radius R [mm], bending angle [degrees], bending surface.

3
Track couplers

Elements:

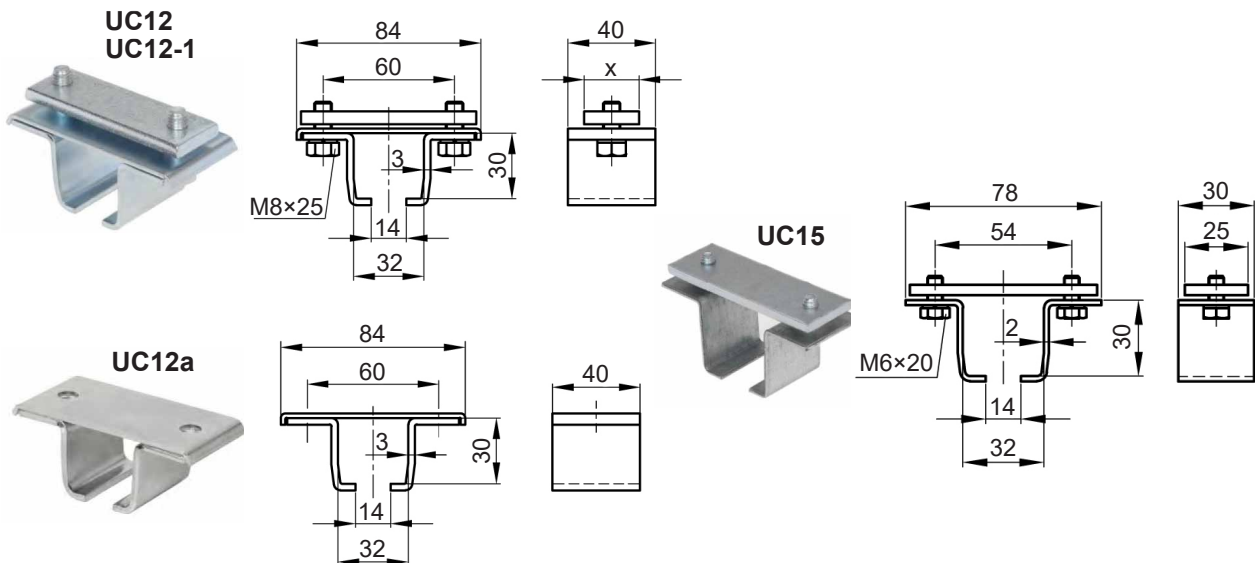
body, bolts, nuts:

Material:

- galvanized steel
- stainless steel 1.4301
- acid resistant steel 1.4571

 Use LC12 **ONLY** for C1A rail

Track support brackets - galvanized steel						N- stainless version 1.4301		K- acid resistant steel 1.4571	
Catalog №	Type	Dimensions [mm]				Catalog №	Type	Catalog №	Type
		S	A	B	M				
1001.00	LC11	3	33	31	M 6	1001.00-N	LC11-N	1001.00-K	LC11-K
1001.10	LC12	2	32,5	30,5	M 5	-	-	-	-
								Weight	
								0,285	
								0,195	

4
Track support bracket

Elements:

body, bolts, nuts:

Material:

- galvanized steel
- stainless steel 1.4301
- acid resistant steel 1.4571

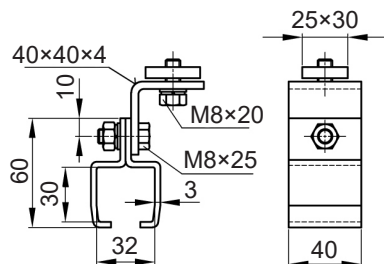
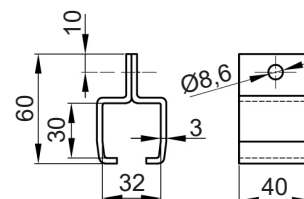
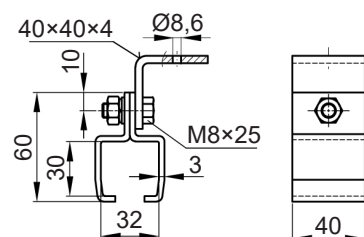
UC12 i UC12-1 – with bolts and threaded plate

UC12a – without bolts and threaded plate

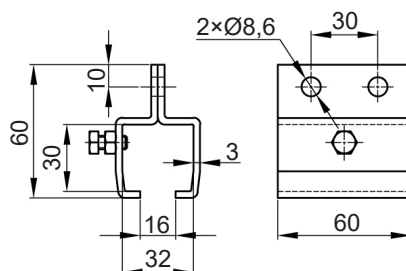
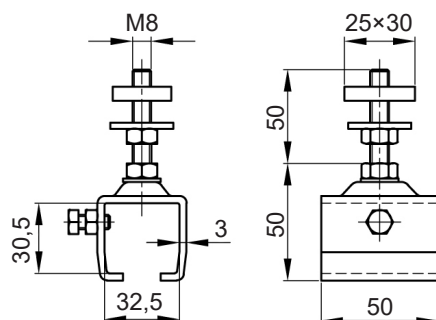
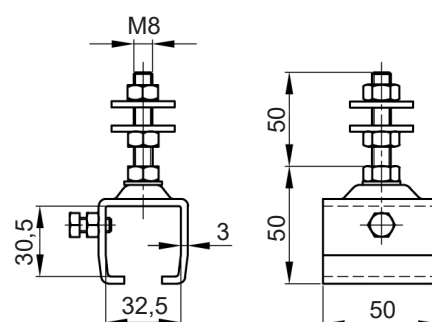
Track support brackets UC12-1 are used for mounting C1 and C1A profiles in C2 rail.
UC15 can be used **only** for C1A rail at low loads.

Track support brackets - galvanized steel				N- stainless version 1.4301		K- acid resistant steel 1.4571		Max. load [kg]	Weight [kg]
Catalog №	Type	Support arm profile	Dimension X [mm]	Catalog №	Type	Catalog №	Type		
1002.10	UC12	C1, C1A	25	1002.10 -N	UC12 -N	1002.10 -K	UC12 -K	63	0,275
1002.11	UC12a	C1, C1A	-	1002.11 -N	UC12a -N	-	-		0,155
1002.12	UC12-1	C2	30	1002.12 -N	UC12-1 -N	-	-		0,285
1002.30	UC15	C1, C1A	-	1002.30-N*	UC15-N*	-	-	10	0,110

* - on request

5
Track support brackets
UC11

UC11a

UC11b


UC11 - with bolts, angle plate and square nut
UC11a - without bolts, angle plate and square nut
UC11b - with bolts, angle plate but without square nut

UC13

UC16-1

UC16-2

Elements:

body, bolts, nuts:

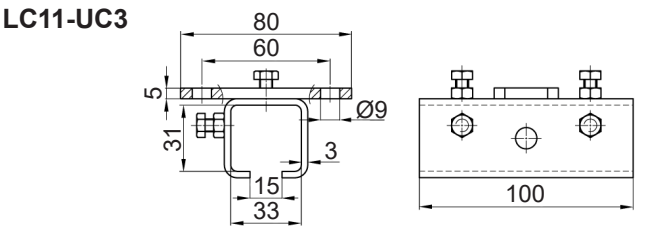
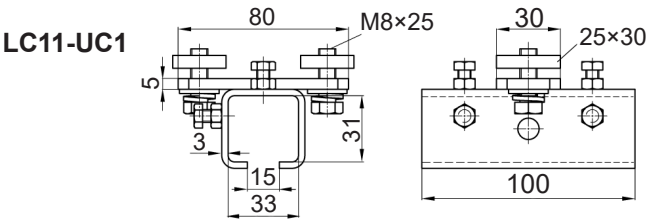
Material:

- galvanized steel
- stainless steel 1.4301
- acid resistant steel 1.4571

Track support brackets - galvanized steel		N- stainless steel 1.4301		K- acid resistant steel 1.4571		Maximum load [kg]	Weight [kg]
Catalog №	Type	Catalog №	Type	Catalog №	Type		
1003.00	UC11	1003.00 -N	UC11 -N	1003.00 -K	UC11 -K	63	0,295
1003.10	UC11a	1003.10 -N	UC11a -N	-	-		0,135
1003.20	UC11b	1003.10 -N	UC11b -N	-	-		0,245
1004.00	UC13	1004.00 -N	UC13 -N	-	-	80	0,205
1003.50	UC16-1	1003.50 -N	UC16-1 -N	-	-	63	0,210
1003.51	UC16-2	1003.51 -N	UC16-2 -N	-	-		0,190

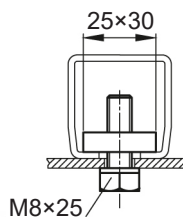
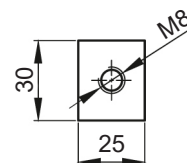
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6	Coupler - holder
----------	-------------------------



Elements: body, bolts, nuts:
Material: - galvanized steel

Catalog №	Type	Maximum load [kg]	Weight [kg]
1001.20	LC11-UC1	150	0,495
1001.21	LC11-UC3		0,390

7 Bolt with square nut, Square nut
M8×25/N

M8-4KT

Elements:

body, bolts, nuts:

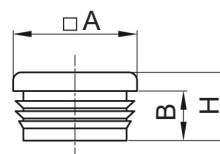
Material:

- galvanized steel
- stainless steel 1.4301
- acid resistant steel 1.4571

Bolt with square nut - galvanized steel		N- stainless steel 1.4301		K- acid resistant 1.4571		Weight [kg]
Catalog №	Type	Catalog №	Type	Catalog №	Type	
1002.25	M8×25/N	1002.25-N	M8×25/N-N	1002.25-K	M8×25/N-K	0,045
1002.26	M8-4KT	1002.26-N	M8-4KT-N	1002.26-K	M8-4KT-K	0,040

8 End caps

P30

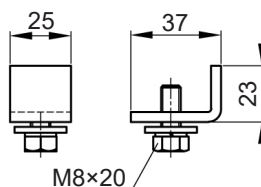
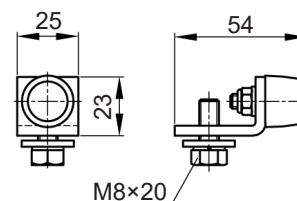
P40

Elements:

end cap

Material:

- plastic

Catalog №	Typ	Rail	Dimensions [mm]			Weight [kg]
			A	B	H	
1013.00	P30	C1, C1A	30	12	16,5	0,004
1013.01	P40	C2	40	15	19,5	0,005

9 End stops
ZC10

ZC10-ZG

Elements:

bolts, nuts:

bumper

Material:

- galvanized steel / stainless steel
- rubber EPDM

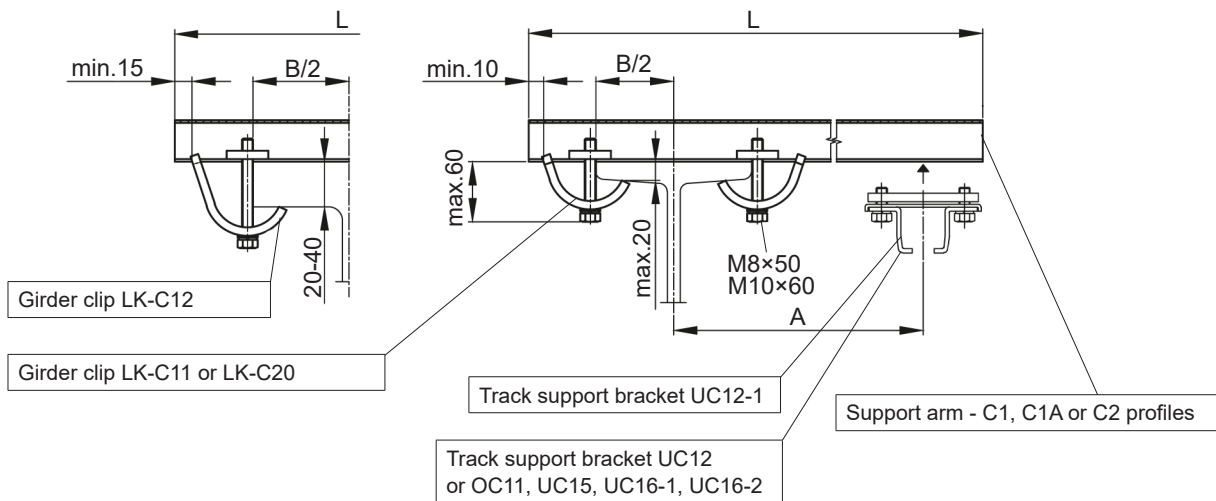
 End stop should be mounted on the C-rail
- between first trolley and end clamp (or regulated clamp).

End stop - galvanized steel		N- stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
1008.00	ZC10	1008.00-N	ZC10-N	0,045
1008.10	ZC10-ZG	1008.10-N	ZC10-ZG-N	0,055

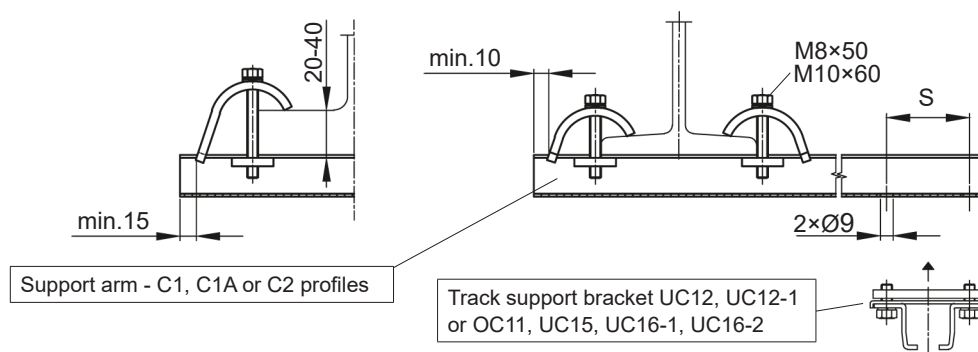
10

Examples of mounting support arms with girder clips

a) Support mounted on higher shelf



b) Support mounted on lower shelf (holes on request)

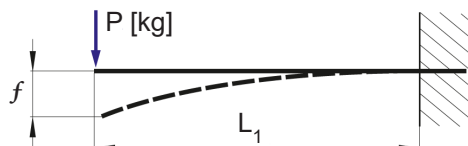


Dimension S - distance between holes 60 [mm] for brackets UC12
- distance between holes 54 [mm] for brackets UC15

11

Permissible support arm load

P - overall load [kg]
L₁ - active support arm length [mm]
f - support arm deflection [mm]



Support arm profile C1 30×32×2		L ₁ [mm]									
		250	350	450	550	650	850	1050	1350	1650	1850
P	[kg]	75,12	53,57	41,57	33,92	28,61	21,70	17,38	13,24	10,56	9,22
f	[mm]	1,1	2,1	3,4	5,1	7,1	12,0	18,1	29,3	42,5	52,2
Support arm profile C2 40×40×2,5											
P	[kg]	166,41	118,72	92,18	75,27	63,53	48,28	38,77	29,70	23,83	20,93
f	[mm]	0,8	1,6	2,7	4,0	5,6	9,6	14,5	23,6	34,4	42,6

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12 Support arm length calculation using girder clips

$$\text{Support arm length: } L = A + \frac{B}{2} + k$$

L - support arm length [mm]

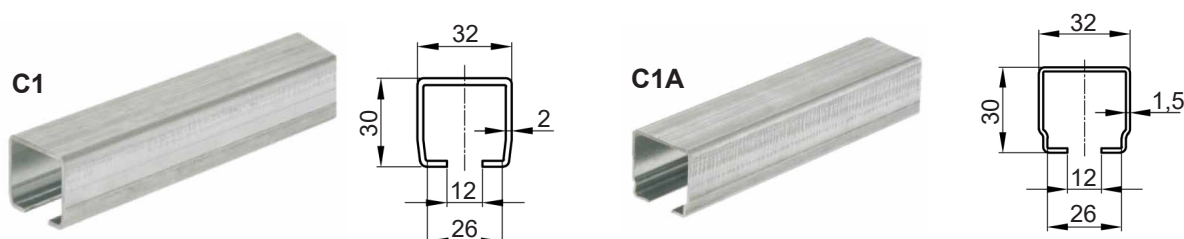
A - distance from I-beam axis to bracket axis [mm]

B - I-beam footing width [mm]

k - length addition coefficient [mm]

coefficient k [mm]	track suport bracket
95	UC12, UC12-1
90	UC15
50	UC11, UC16-1, UC16-2

ATTENTION !	support arm		end caps	
	C1	C1A	P30	coefficient „k” should be increased by 30 [mm]
	C2	-	P40	coefficient „k” should be increased by 40 [mm]

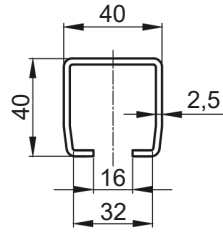
13 Support arm profiles C1 i C1A


old formed Sendzimir galvanized steel		stainless steel 1.4301		acid resistant steel 1.4571		Length L L [mm]	Weight [kg]
Catalog №	Type	Catalog №	Type	Catalog №	Type		
1006.00-400	KL-C1/400	1006.00-400-N	KL-C1/400-N	1006.00-400-K	KL-C1/400-K	400	0,595
1006.00-500	KL-C1/500	1006.00-500-N	KL-C1/500-N	1006.00-500-K	KL-C1/500-K	500	0,745
1006.00-600	KL-C1/600	1006.00-600-N	KL-C1/600-N	1006.00-600-K	KL-C1/600-K	600	0,895
1006.00-700	KL-C1/700	1006.00-700-N	KL-C1/700-N	1006.00-700-K	KL-C1/700-K	700	1,045
1006.00-800	KL-C1/800	1006.00-800-N	KL-C1/800-N	1006.00-800-K	KL-C1/800-K	800	1,195
1006.00-1000	KL-C1/1000	1006.00-1000-N	KL-C1/1000-N	1006.00-1000-K	KL-C1/1000-K	1000	1,490
1006.00-1200	KL-C1/1200	1006.00-1200-N	KL-C1/1200-N	1006.00-1200-K	KL-C1/1200-K	1200	1,790
1006.00-1500	KL-C1/1500	1006.00-1500-N	KL-C1/1500-N	1006.00-1500-K	KL-C1/1500-K	1500	2,235
1006.00-1800	KL-C1/1800	1006.00-1800-N	KL-C1/1800-N	1006.00-1800-K	KL-C1/1800-K	1800	2,685
1006.00-2000	KL-C1/2000	1006.00-2000-N	KL-C1/2000-N	1006.00-2000-K	KL-C1/2000-K	2000	2,980
1006.10-400	KL-C1A/400	1006.10-400-N	KL-C1A/400-N	-	-	400	0,440
1006.10-500	KL-C1A/500	1006.10-500-N	KL-C1A/500-N	-	-	500	0,550
1006.10-600	KL-C1A/600	1006.10-600-N	KL-C1A/600-N	-	-	600	0,660
1006.10-700	KL-C1A/700	1006.10-700-N	KL-C1A/700-N	-	-	700	0,770
1006.10-800	KL-C1A/800	1006.10-800-N	KL-C1A/800-N	-	-	800	0,880
1006.10-1000	KL-C1A/1000	1006.10-1000-N	KL-C1A/1000-N	-	-	1000	1,100
1006.10-1200	KL-C1A/1200	1006.10-1200-N	KL-C1A/1200-N	-	-	1200	1,320
1006.10-1500	KL-C1A/1500	1006.10-1500-N	KL-C1A/1500-N	-	-	1500	1,650
1006.10-1800	KL-C1A/1800	1006.10-1800-N	KL-C1A/1800-N	-	-	1800	1,980
1006.10-2000	KL-C1A/2000	1006.10-2000-N	KL-C1A/2000-N	-	-	2000	2,200

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14 Support arm profile C2

C2

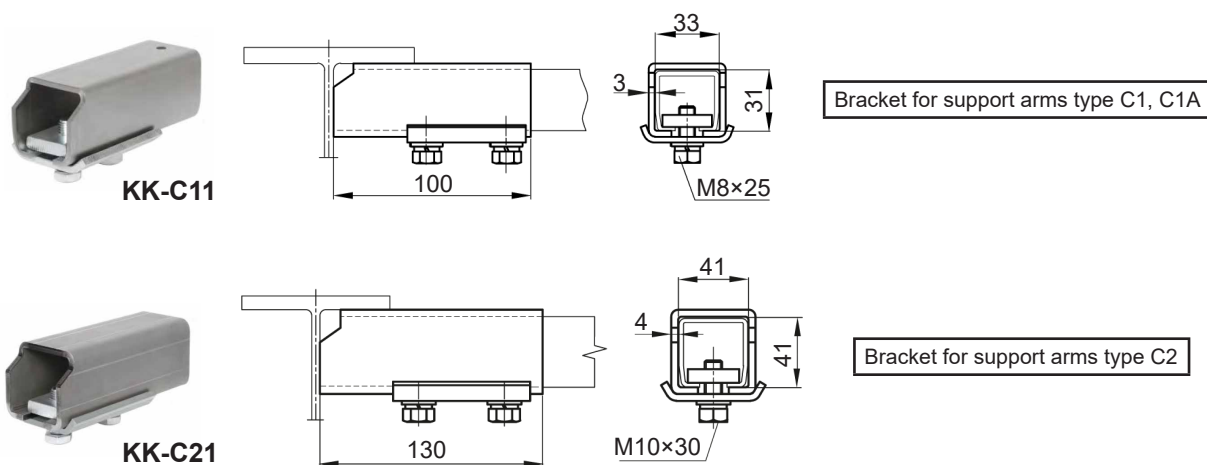


cold formed Sendzimir galvanized steel			
Catalog №	Type	Length L [mm]	Weight [kg]
2006.10-400	KL-C2/400	400	0,980
2006.10-500	KL-C2/500	500	1,225
2006.10-600	KL-C2/600	600	1,470
2006.10-700	KL-C2/700	700	1,750
2006.10-800	KL-C2/800	800	1,960
2006.10-1000	KL-C2/1000	1000	2,450
2006.10-1200	KL-C2/1200	1200	2,940
2006.10-1500	KL-C2/1500	1500	3,675
2006.10-1800	KL-C2/1800	1800	4,410
2006.10-2000	KL-C2/2000	2000	4,900

ATTENTION !

There is a possibility to request other support arm lengths, than signed in the tables. In that case, give the type and catalog number as follows: **type KL-C1/1150 № 1006.00-1150**

Type	KL-C1/1150	Catalog №	1006.00-1150
	KL-C1A/1150		1006.10-1150
	KL-C2/1150		2006.00-1150

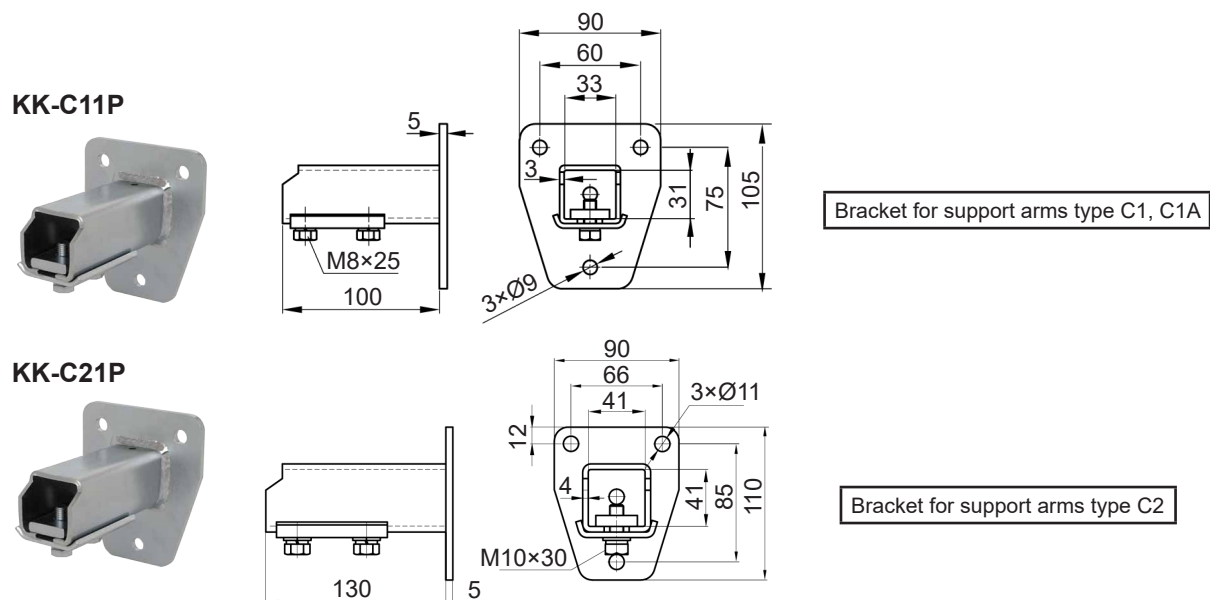
15 Support arm brackets

Elements:

 bracket
pressure plate, bolts, nuts

Material:

 - carbon steel / stainless steel 1.4301
- galvanized steel / stainless steel 1.4301

carbon steel		stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
1007.00	KK - C11	1007.00 -N	KK - C11 -N	0,480
2007.00	KK - C21	-	-	0,900

16 Support arm brackets with base

Elements:

bracket, pressure plate, bolts, nuts

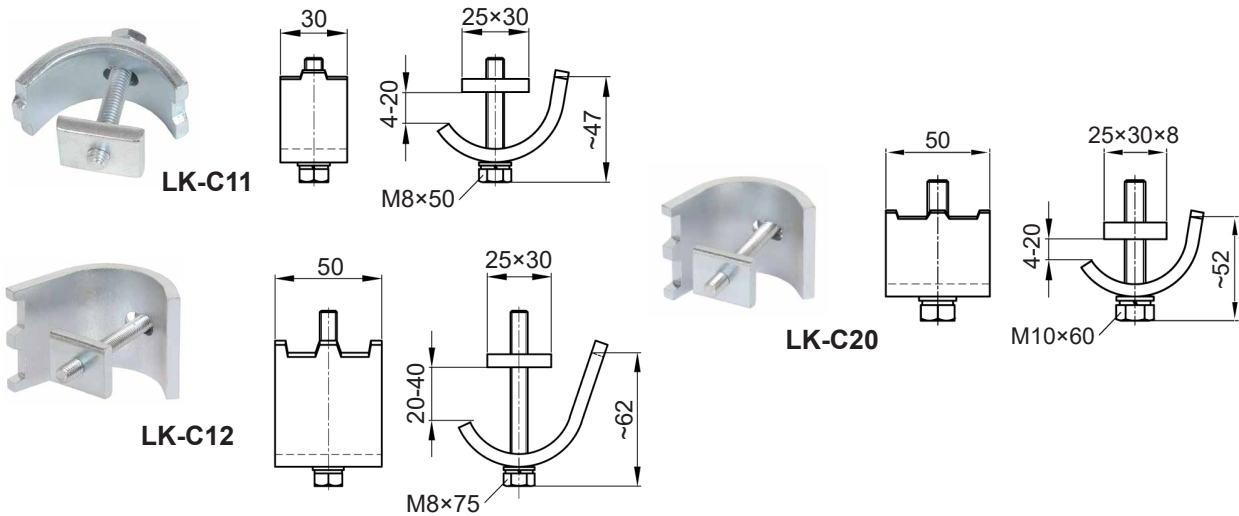
Material:

- galvanized / stainless steel 1.4301

galvanized steel		stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
1007.10	KK - C11P	1007.10 -N	KK - C11P -N	0,770
2007.10	KK - C21P	-	-	1,250

17

Girder clips



Elements:

girder clip, square nut, bolt, pad

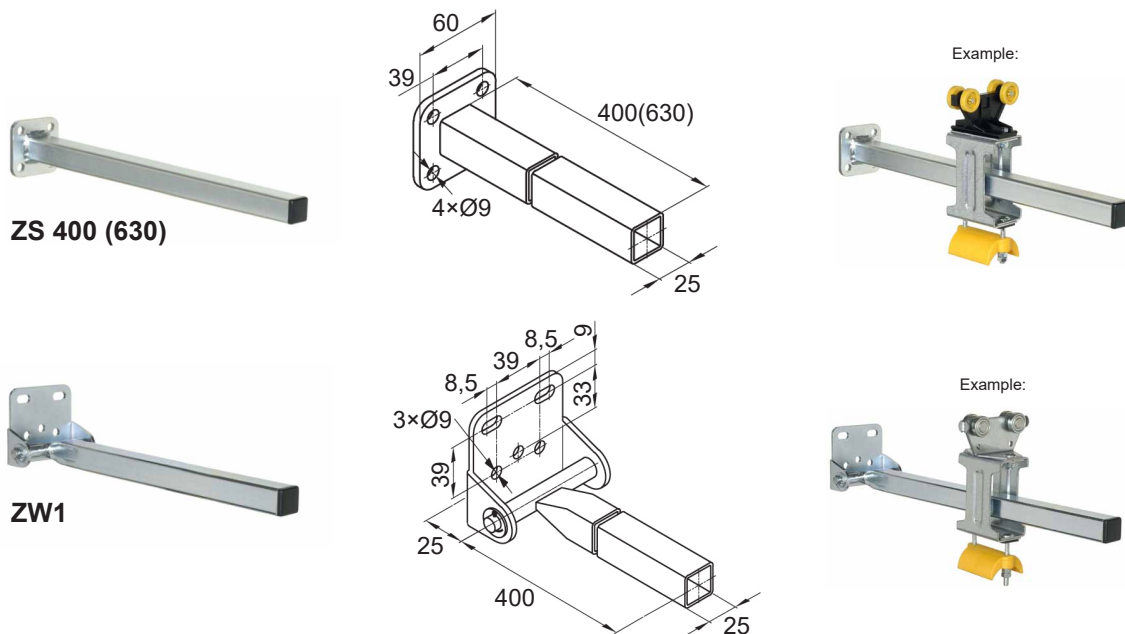
Material:

- galvanized steel/ stainless steel 1.4301

galvanized steel		stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
1005.01	LK - C11	1005.01 -N	LK - C11 -N	0,150
1005.20	LK - C12	1005.20 -N	LK - C12 -N	0,275
1005.30	LK - C20	1005.30 -N	LK - C20 -N	0,250

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Towing arms and swinging towing arms



galvanized steel		stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
1015.01	ZS 400	1015.01 -N	ZS 400-N	0,750
1015.02	ZS 630	1015.02 -N	ZS 630-N	1,090
1014.01	ZW1	1014.01 -N	ZW1 -N	1,000

CABLE TROLLEYS

Cable trolleys for flat cables sign example

a) Cable trolleys for flat cables sign example:



Type of the trolley	WKT - P1A - 90 x 76 x D50 T
Types of rollers	WKZT - P1A - 90 x 76 x D50 T
Length of the trolley [mm]	
Cable support width [mm]	
Cable support diameter [mm]	
Plastic cable support [mm]	

b) Cable trolleys for flat cables sign example:



Type of the trolley	WK - P1 - 125 x 96 x D80 T
Length of the trolley [mm]	WKZ - P1 - 125 x 96 x D80 T
Cable support width [mm]	
Cable support diameter [mm]	
Plastic cable support [mm]	

c) End clamp sign example:



End clamp's type	ZKP - 76 x D80 T
Cable support width [mm]	
Cable support diameter [mm]	
Plastic cable support [mm]	

Cable trolleys for round cables sign example

a) Examples of cable trolleys for flat cables:



Type of the trolley	WKT - R1A - 90
Type of rollers	WKZT - R1A - 90
Length of the trolley [mm]	

b) Cable trolleys for round cables sign example:



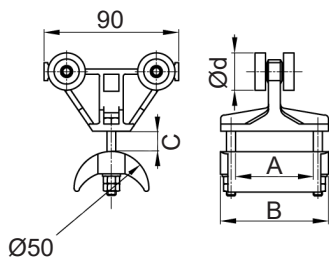
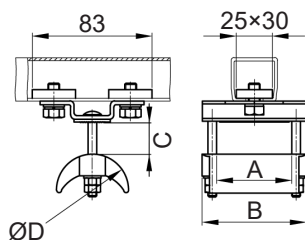
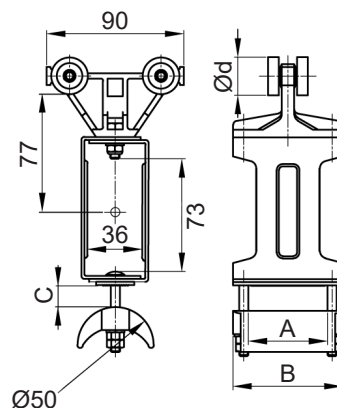
Type of the trolley	WK - R1 - 125
Length of the trolley [mm]	WKZ - R1 - 125

c) End clamp sign example:



End clamp's type	ZR1
------------------	-----

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Plastic cable trolleys, towing trolleys and end clamps
WKT-P1

ZKP

WKZT-P1

Elementy:

trolley's body, cable support
end clamp's body, towing trolley yoke
pad
axles, screws
nuts

Material:

- polyamide PA (roller's type: A, B, C, D) or polypropylene (roller's type: H)
- cold formed Sendzimir galvanized steel PN-EN 10327 or stainless 1.4301
- polyamide PA or polypropylene PP (on request)
- galvanized steel and stainless steel 1.4301
- polyamide PA

Maximum trolley speed: up to 40 m/min
Working temperature: from -20°C do +50°C

GALVANIZED STEEL

Cable trolley WKT-P1			Towing trolley WKZT-P1							
Catalog №	Type	Weight [kg]	Catalog №	Type	Weight [kg]	Dimensions [mm]			Maximum load [kg]	
						A	B	C	PA	PP
1016.01	WKT-P1A-90×76×D50T	0,110	1017.01	WKZT-P1A-90×76×D50T	0,390	52	76	22	6	4
1016.03	WKT-P1B-90×76×D50T	0,115	1017.03	WKZT-P1B-90×76×D50T	0,395				6	
1016.15	WKT-P1C-90×76×D50T	0,180	1017.15	WKZT-P1C-90×76×D50T	0,460				10	
1016.17	WKT-P1D-90×76×D50T	0,125	1017.17	WKZT-P1D-90×76×D50T	0,430				4	
-	-	0,115	-	-	0,390				6	
1016.02	WKT-P1A-90×96×D50T	0,120	1017.02	WKZT-P1A-90×96×D50T	0,400	72	96	22	6	4
1016.04	WKT-P1B-90×96×D50T	0,125	1017.04	WKZT-P1B-90×96×D50T	0,405				6	
1016.16	WKT-P1C-90×96×D50T	0,190	1017.16	WKZT-P1C-90×96×D50T	0,469				10	
1016.18	WKT-P1D-90×96×D50T	0,150	1017.18	WKZT-P1D-90×96×D50T	0,550				4	
-	-	0,125	-	-	0,400				6	

End clamp ZKP			Dimensions [mm]			
Catalog №	Type	Weight [kg]				
			D	A	B	C _{max}
1012.10	ZKP-76×D50T	0,265	50	52	76	26
1012.11	ZKP-96×D50T	0,310	50	72	96	26

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STAINLESS STEEL 1.4301

Cable trolley WKT-P1 -N			Towing trolley WKZT-P1 -N							
Catalog №	Type	Weight [kg]	Catalog №	Type	Weight [kg]	Dimensions [mm]			Max. load [kg]	
						A	B	C	PA	PP
1016.01-N	WKT-P1A-90×76×D50T-N	0,110	1017.01-N	WKZT-P1A-90×76×D50T-N	0,390	52	76	22	6	4
1016.03-N	WKT-P1B-90×76×D50T-N	0,115	1017.03-N	WKZT-P1B-90×76×D50T-N	0,395				6	
1016.15-N	WKT-P1C-90×76×D50T-N	0,180	1017.15-N	WKZT-P1C-90×76×D50T-N	0,460				10	
1016.17-N	WKT-P1D-90×76×D50T-N	0,125	1017.17-N	WKZT-P1D-90×76×D50T-N	0,430				4	
1016.19-N	WKT-P1H-90×76×D50T-N	0,115	1017.19-N	WKZT-P1H-90×76×D50T-N	0,390				6	
1016.02-N	WKT-P1A-90×96×D50T-N	0,120	1017.02-N	WKZT-P1A-90×96×D50T-N	0,400	72	96	22	6	4
1016.04-N	WKT-P1B-90×96×D50T-N	0,125	1017.04-N	WKZT-P1B-90×96×D50T-N	0,405				6	
1016.16-N	WKT-P1C-90×96×D50T-N	0,190	1017.16-N	WKZT-P1C-90×96×D50T-N	0,469				10	
1016.18-N	WKT-P1D-90×96×D50T-N	0,150	1017.18-N	WKZT-P1D-90×96×D50T-N	0,550				4	
1016.20-N	WKT-P1H-90×96×D50T-N	0,125	1017.20-N	WKZT-P1H-90×96×D50T-N	0,400				6	

End clamp ZKP -N			Dimensions [mm]			
Catalog №	Type	Weight [kg]	D	A	B	C _{max}
1012.10-N	ZKP-76×D50T-N	0,265	50	52	76	26
1012.11-N	ZKP-96×D50T-N	0,310	50	72	96	26

Cable trolleys Cat. № 1016.19-N and 1016.20-N - increased chemical resistivity plastic (polypropylene PP).

Rollers:

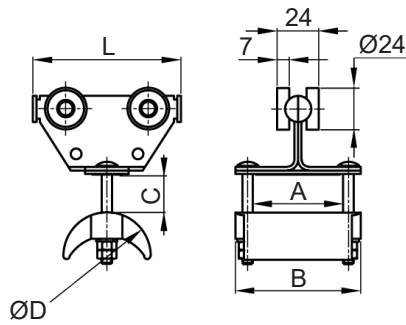


Roller type	Ø d [mm]	MATERIAL		
		Rollers	Axle	Pans
A	25	polyamide PA	stainless steel 1.4301	-
B				polymer
C	24	galvanized covered rolling bearings ZZ (on request 2RS)	galvanized steel and stainless steel 1.4301	-
D	25	galvanized covered rolling bearings ZZ (on request 2RS): - plastic outer ring - stainless steel 1.4301 inner ring	stainless steel 1.4301	-
H		polypropylene PP		polymer

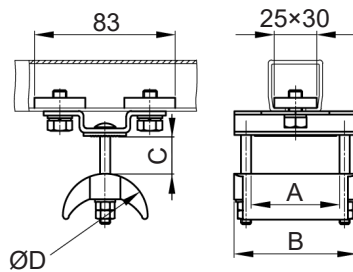
20

Steel cable trolleys, towing trolleys and end clamps with plastic or steel cable support

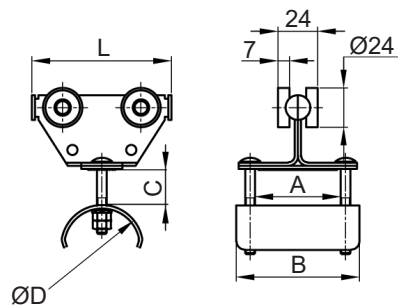
WK-P1-...×D50T
×D80T



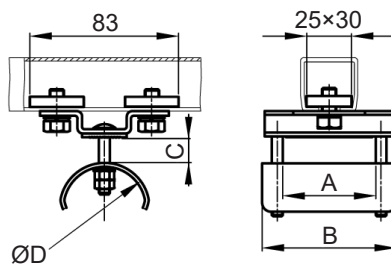
ZKP-...×D50T
×D80T



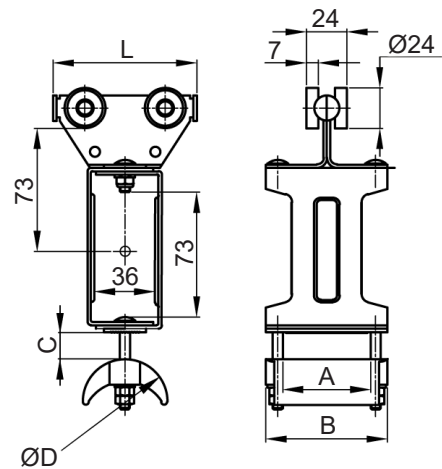
WK-P1



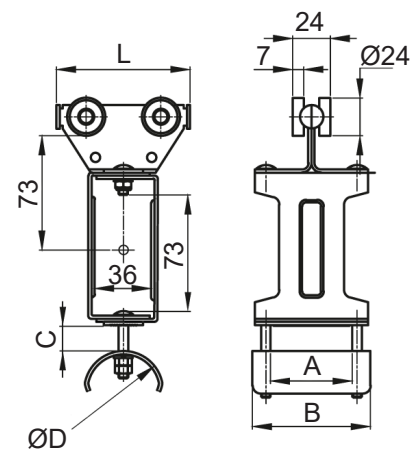
ZKP



WKZ-P1-...×D50T
×D80T



WKZ-P1



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GALVANIZED STEEL

Cable trolley WK-P1			Towing trolley WKZ-P1			Dimensions [mm]				
Catalog №	Type	Weight [kg]	Catalog №	Type	Weight [kg]					
Trolleys with plastic cable support										
1010.16	WK-P1-85×76×D50T	0,275	1011.16	WKZ-P1-85×76×D50T	0,535	85	50	52	76	15
1010.10	WK-P1-95×76×D50T	0,310	1011.10	WKZ-P1-95×76×D50T	0,545	95				25
1010.12	WK-P1-108×76×D80T	0,320	1011.12	WKZ-P1-108×76×D80T	0,565	108				
1010.31	WK-P1-125×76×D80T	0,335	1011.31	WKZ-P1-125×76×D80T	0,590	125	80	72	96	25
1010.17	WK-P1-85×96×D50T	0,300	1011.17	WKZ-P1-85×96×D50T	0,625	85	50			
1010.11	WK-P1-95×96×D50T	0,315	1011.11	WKZ-P1-95×96×D50T	0,640	95				
1010.13	WK-P1-108×96×D80T	0,335	1011.13	WKZ-P1-108×96×D80T	0,660	108				
1010.32	WK-P1-125×96×D80T	0,365	1011.32	WKZ-P1-125×96×D80T	0,685	125	80			
Trolleys with steel cable support										
1010.18	WK-P1-85×76×D50	0,355	1011.18	WKZ-P1-85×76×D50	0,645	85	50	52	76	15
1010.20	WK-P1-95×76×D50	0,365	1011.20	WKZ-P1-95×76×D50	0,660	95				20
1010.19	WK-P1-85×96×D50	0,400	1011.19	WKZ-P1-85×96×D50	0,795	85				25
1010.21	WK-P1-95×96×D50	0,405	1011.21	WKZ-P1-95×96×D50	0,795	95	72	96	20	30
1010.36	WK-P1-125×96×D80	0,495	1011.36	WKZ-P1-125×96×D80	0,835	125				80

End clamp ZKP			Dimensions [mm]						
Catalog №	Type	Weight [kg]							
D							A	B	C _{max}
Clamps with plastic cable support									
1012.10	ZKP-76×D50T	0,265	50	52	76	25			
1012.11	ZKP-96×D50T	0,310		72	96				
1012.40	ZKP-76×D80T	0,285	80	52	76				
1012.41	ZKP-96×D80T	0,330		72	96				
Clamps with steel cable support									
1012.14	ZKP-76×D50	0,315	50	52	76	15			
1012.15	ZKP-96×D50	0,360	80	72	96				
1012.16	ZKP-96×D80	0.600	85			25			

STAINLESS STEEL 1.4301

Cable trolley WK-P1-N			Towing trolley WKZ-P1-N			Dimensions [mm]					
Catalog №	Typ	Weight [kg]	Catalog №	Typ	Weight [kg]						
L	D	A	B	C _{max}							
Trolleys with plastic cable support											
1010.16-N	WK-P1-85×76×D50T-N	0,275	1011.16-N	WK-P1-85×76×D50T-N	0,535	85	50	52	76	15	
1010.10-N	WK-P1-95×76×D50T-N	0,310	1011.10-N	WK-P1-95×76×D50T-N	0,545	95				80	25
1010.12-N	WK-P1-108×76×D80T-N	0,320	1011.12-N	WK-P1-108×76×D80T-N	0,565	108					
1010.31-N	WK-P1-125×76×D80T-N	0,335	1011.31-N	WK-P1-125×76×D80T-N	0,590	125	80	72	96	15	
1010.17-N	WK-P1-85×96×D50T-N	0,300	1011.17-N	WK-P1-85×96×D50T-N	0,625	85	50			25	
1010.11-N	WK-P1-95×96×D50T-N	0,315	1011.11-N	WK-P1-95×96×D50T-N	0,640	95					
1010.13-N	WK-P1-108×96×D80T-N	0,335	1011.13-N	WK-P1-108×96×D80T-N	0,660	108					
1010.32-N	WK-P1-125×96×D80T-N	0,365	1011.32-N	WK-P1-125×96×D80T-N	0,685	125	80				
Trolleys with steel cable support											
1010.18-N	WK-P1-85×76×D50-N	0,355	1011.18-N	WKZ-P1-85×76×D50-N	0,645	85	50	52	76	15	
1010.20-N	WK-P1-95×76×D50-N	0,365	1011.20-N	WKZ-P1-95×76×D50-N	0,660	95	50	52	76	20	
1010.19-N	WK-P1-85×96×D50-N	0,400	1011.19-N	WKZ-P1-85×96×D50-N	0,795	85	50	72	96	25	
1010.21-N	WK-P1-95×96×D50-N	0,405	1011.21-N	WKZ-P1-95×96×D50-N	0,795	95	50	72	96	30	
1010.36-N	WK-P1-125×96×D50-N	0,495	1011.36-N	WKZ-P1-125×96×D80-N	0,835	125	80	72	96	20	

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End clamp ZKP-N			Dimensions [mm]			
Catalog №	Type	Weight [kg]				
Clamps with plastic cable support						
1012.10-N	ZKP-76×D50T-N	0,265	50	52	76	25
1012.11-N	ZKP-96×D50T-N	0,310		72	96	
1012.40-N	ZKP-76×D80T-N	0,285	80	52	76	
1012.41-N	ZKP-96×D80T-N	0,330		72	96	
Clamps with steel cable support						
1012.14-N	ZKP-76×D50-N	0,315	50	52	76	15
1012.15-N	ZKP-96×D50-N	0,360	80	72	96	15
1012.16-N	ZKP-96×D80-N	0,600	85	72	96	25

Elements:
Material:

trolley's body, cable support	- galvanized steel and stainless steel 1.4301
end clamp's body, towing trolley yoke	- cold formed Sendzimir galvanized steel PN-EN 10327 or stainless 1.4301
rollers	- covered rolling bearings
pad	- polyamide PA or polypropylene PP (on request)
axles, screws	- galvanized steel and stainless steel 1.4301
nuts	- polyamide PA

TROLLEYS WITH PLASTIC CABLE SUPPORT

Maximum trolley speed:	up to 50 m/min
Working temperature of cable trolley:	from -20°C to +80°C
Working temperature of towing trolley:	from -20°C to +80°C
Working temperature of end clamp:	from -20°C to +50°C
Maximum trolley load:	galvanized steel: 10 [kg]; stainless steel: 6 [kg]
Maximum towing trolley load:	galvanized steel: 20 [kg]; stainless steel: 10 [kg]

TROLLEYS WITH STEEL CABLE SUPPORT

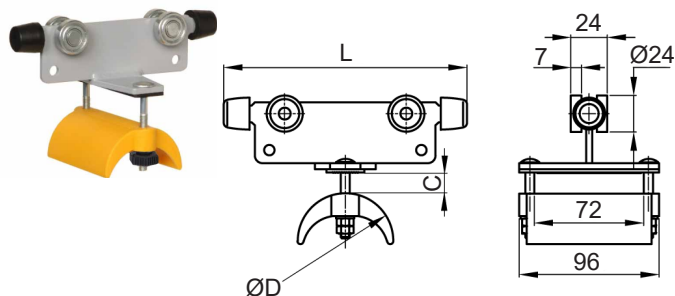
Maximum trolley speed:	up to 80 m/min
Working temperature of cable trolley:	from -30°C to +80°C
Working temperature of towing trolley:	from -30°C to +80°C
Working temperature of end clamp:	from -30°C to +80°C
Maximum trolley load:	galvanized steel: 16 [kg]; stainless steel: 10 [kg]
Maximum towing trolley load:	galvanized steel: 25 [kg]; stainless steel: 12 [kg]

Cable trolleys can be also equipped in one or two bumpers **ZG-01** (page 33).
As a result, trolley lenght is increased by 12.5 [mm] (with one bumper) or 25 [mm] (with two bumpers).

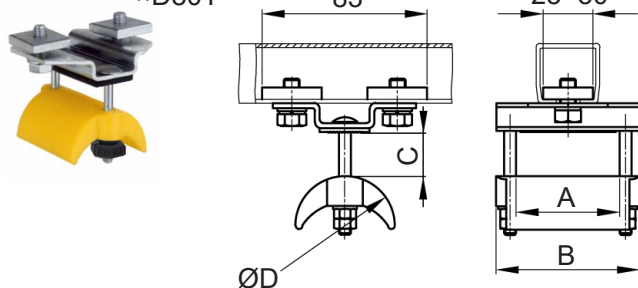
21

Steel cable trolleys, towing trolleys and end clamps with bumpers and plastic or steel cable support

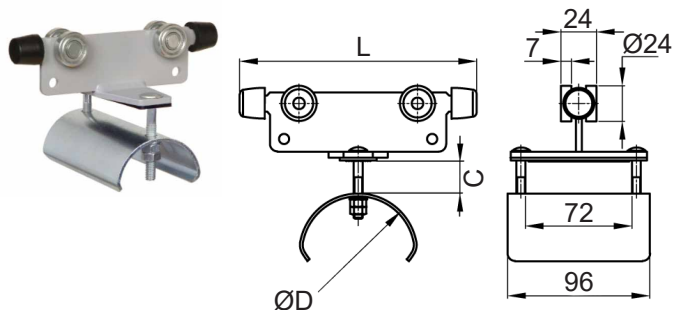
WK-P1-...×D50T
×D80T



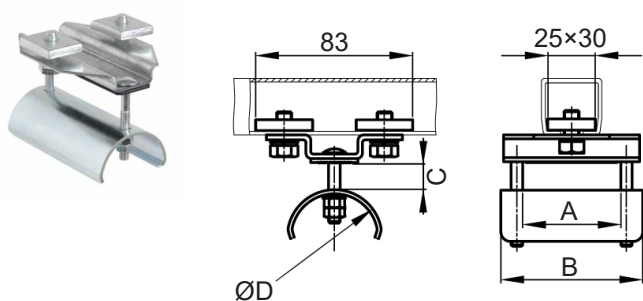
ZKP-P1-...×D50T
×D80T



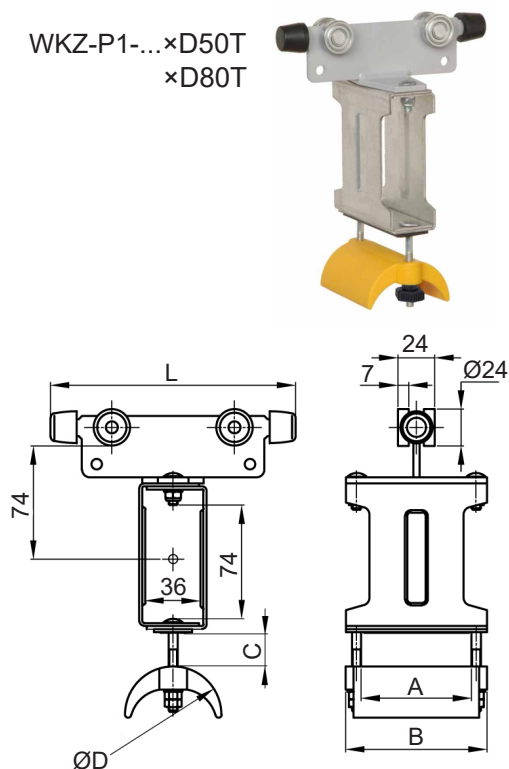
WK-P1



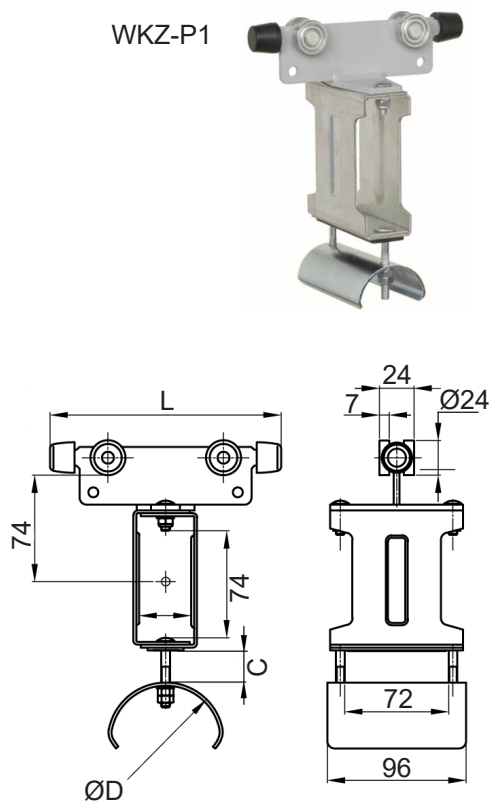
ZKP-P1



WKZ-P1-...×D50T
×D80T



WKZ-P1



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Cable trolley WK			Towing trolley WKZ			Dimensions [mm]		
Catalog №	Type	Weight [kg]	Catalog №	Type	Weight [kg]			
Trolleys with plastic cable support								
1060.24	WK-P1-160×96×D50T	0,325	1061.24	WKZ-P1-160×96×D80T	0,710	160	80	30
1060.25	WK-P1-200×96×D50T	0,375	1061.25	WKZ-P1-200×96×D80T	0,760	200		50
Trolleys with steel cable support								
1060.02	WK-P1-160×96×D50	0,410	1061.02	WKZ-P1-160×96×D50	0,790	160	50	40
1060.03	WK-P1-200×96×D50	0,460	1061.03	WKZ-P1-200×96×D50	0,840	200		50
1060.32	WK-P1-160×96×D80	0,750	1061.32	WKZ-P1-160×96×D80	1,130	160	80	30
1060.33	WK-P1-200×96×D80	0,800	1061.33	WKZ-P1-200×96×D80	1,180	200		50

End clamp ZKP			Dimensions [mm]			
Catalog №	Type	Weight [kg]	D	A	B	C _{max}
Clamps with plastic cable support						
1012.41	ZKP-96×D80T	0,330	80	72	96	50
Clamps with steel cable support						
1012.15	ZKP-96×D50	0,360	50	72	96	30
1012.16	ZKP-96×D80	0,600	80			50

Stainless version on request!

Elements:

trolley's body
end clamp's body, towing trolley yoke
rollers
cable support, pad
bumpers
axles, screws
nuts

Material:

- powder painted, galvanized steel
- cold formed Sendzimir galvanized steel PN-EN 10327
- covered rolling bearings
- polyamide PA or polypropylene PP (on request)
- rubber EPDM
- galvanized steel
- polyamide PA / galvanized steel (on request)

TROLLEYS WITH PLASTIC CABLE SUPPORT

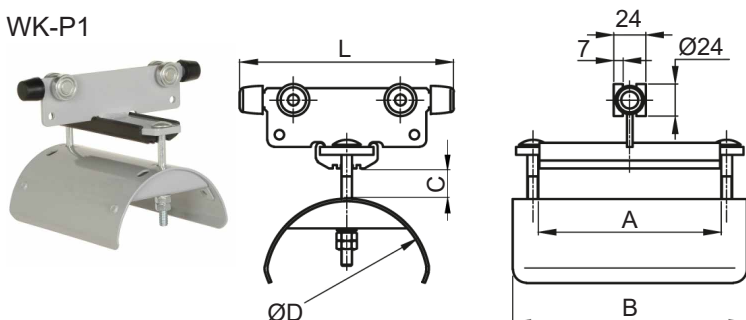
Maximum trolley speed: up to 80 m/min
Working temperature of cable trolley / towing trolley / end clamp: from -20°C to +50°C
Maximum trolley load: galvanized steel: 16 [kg]
Maximum end clamp load: galvanized steel: 20 [kg]

TROLLEYS WITH STEEL CABLE SUPPORT

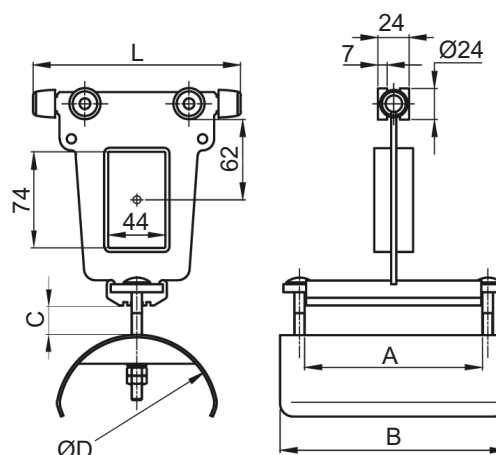
Maximum trolley speed: up to 80 m/min
Working temperature of cable trolley / towing trolley / end clamp: from -30°C to +50°C
Maximum trolley load: galvanized steel: 20 [kg]
Maximum end clamp load: galvanized steel: 25 [kg]

Cable trolleys can be also equipped in one or two bumpers **ZG-01** (page 33).
As a result, trolley length is increased by 12.5 [mm] (with one bumper) or 25 [mm] (with two bumpers).

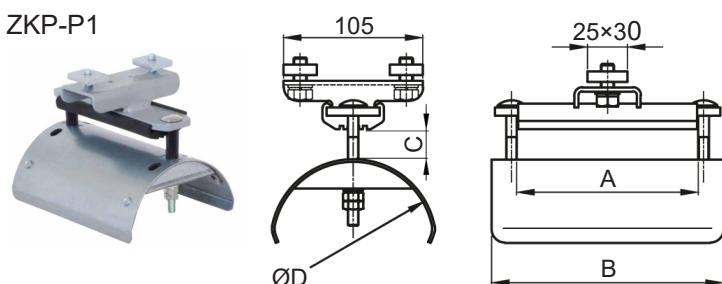
WK-P1



WKZ-P1



ZKP-P1


Elements:

trolley's body
rollers
cable support
separator
bumpers
axles, screws, nuts

Material:

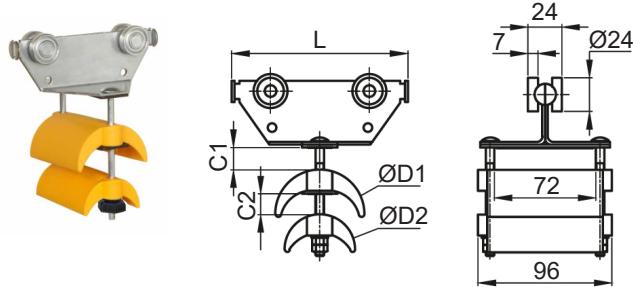
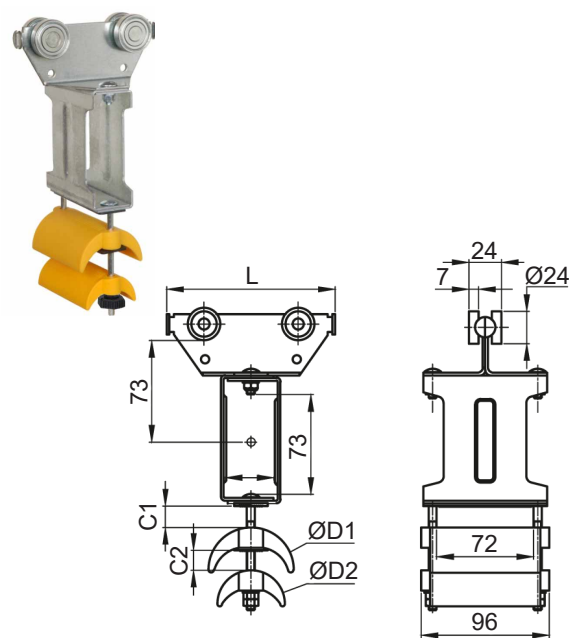
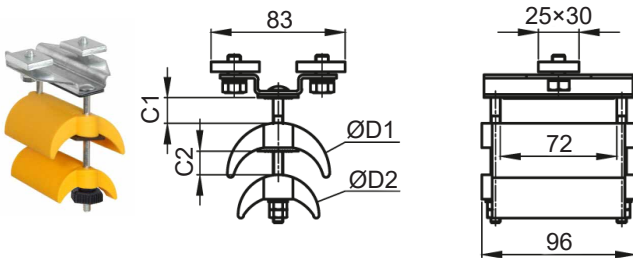
- powder painted, galvanized steel
- covered rolling bearings
- galvanized steel
- thermoplastic elastomer
- rubber EPDM
- galvanized steel

Maximum trolley speed: up to 80 m/min
Working temperature of cable trolley: from -30°C to +80°C
Maximum trolley load: galvanized steel: 20 [kg]
Maximum end clamp load: galvanized steel: 32 [kg]

Cable trolley WK-P1			Towing trolley WKZ-P1			Dimensions [mm]				
Catalog №	Type	Weight [kg]	Catalog №	Type	Weight [kg]	L	D	A	B	C _{max}
1070.01	WK-P1-160×167×D80	0,920	1071.01	WKZ-P1-160×167×D80	1,700	160	80	135	167	30
1070.02	WK-P1-200×167×D80	0,975	1071.02	WKZ-P1-200×167×D80	1,730	200				50
1070.11	WK-P1-160×175×D125	1,340	1071.11	WKZ-P1-160×175×D125	1,980	160	125	175		15
1070.12	WK-P1-200×175×D125	1,460	1071.12	WKZ-P1-200×175×D125	2,980	200			175	30
1070.13	WK-P1-200×175×D160	1,690	1071.13	WKZ-P1-200×175×D160	3,230		160			15
1070.34	WK-P1-200×111×D125	1,150	1071.34	WKZ-P1-200×111×D125	1,600	200	125	72	111	40

End clamp ZKP-P1			Dimensions [mm]			
Catalog №	Type	Weight [kg]	D	A	B	C _{max}
1012.17	ZKP-175×D80	1,285	80	135	167	50
1012.22	ZKP-175×D125	1,500	125		175	
1012.23	ZKP-175×D160	1,755	160			15
1012.34	ZKP-111×D125	1,080	125	72	111	40

The flexible profile PRW-01 is helpful to fill gaps in the set of cables (page 28).

23
Double plastic support cable trolleys, towing trolleys and end clamps
WK-P1

WKZ-P1

ZKP-P1

Elements:
Material:

trolley's / end clamp's body	- powder painted, galvanized steel
rollers	- covered rolling bearings
cable support	- polyamide PA or polypropylene PP (on request)
separator	- thermoplastic elastomer
towing trolley yoke	- galvanized steel
axles, screws, nuts	- galvanized steel

Maximum trolley speed:	up to 50 m/min
Working temperature of cable trolley:	from -20°C to +50°C
Maximum trolley load:	galvanized steel: 10 [kg]
Maximum end clamp load:	galvanized steel: 20 [kg]

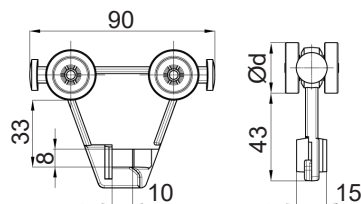
Cable trolley WK-P1			Towing trolley WKZ-P1			Dimensions [mm]				
Catalog №	Type	Weight [kg]	Catalog №	Type	Weight [kg]	L	D1	D2	C1 _{max}	C2 _{max}
1040.20	WK-P1-125×96×(D80T+D50T)	0,420	1041.20	WKZ-P1-125×96×(D80T+D50T)	0,710	125	80	50	20	17

End clamp ZKP-P1			Dimensions [mm]			
Catalog №	Type	Weight [kg]	D1	D2	C1 _{max}	C2 _{max}
1012.30	ZKP-96×(D80T+D50T)	0,370	80	50	20	17

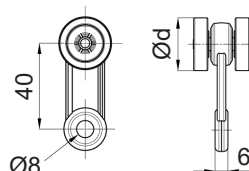
Cable trolleys can be also equipped in one or two bumpers **ZG-01** (page 33).
As a result, trolley length is increased by 12.5 [mm] (with one bumper) or 25 [mm] (with two bumpers).

24
Special plastic (polyamide PA) cable trolleys

WKT-S1...



WKT-S1...m



Example:

UL-130



UL-230

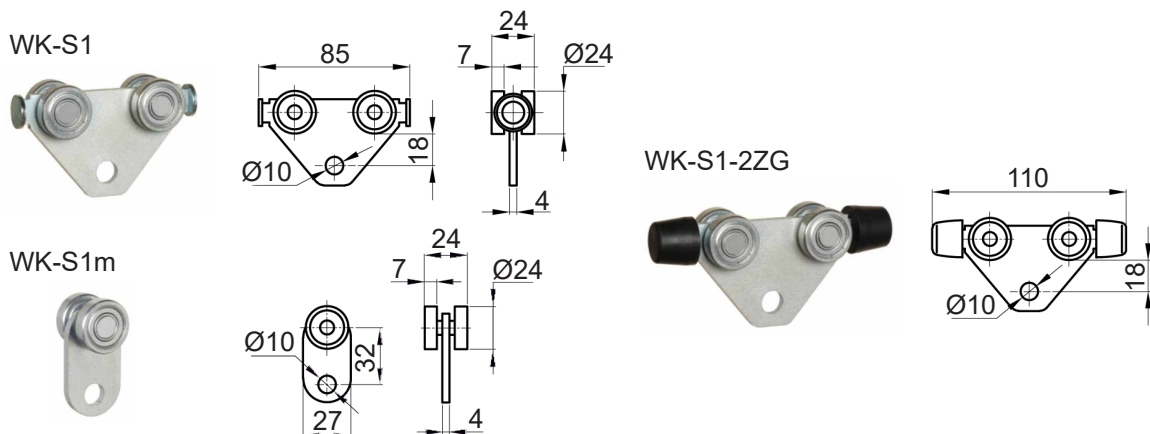


Catalog №	Type	Maximum trolley speed	Maximum trolley load [kg]	Weight [kg]
1053.21	WKT-S1 Bm	up to 16 [m/min]	2	0,020
1053.22 -N	WKT-S1 Cm -N			0,050
1053.31	WKT-S1 B	up to 30 [m/min]	5	0,040
1053.32 -N	WKT-S1 C -N			0,080

Working temperature: from -20°C to +50°C

Rollers:


Roller type	Ø d [mm]	MATERIAL		
		Rollers	Axle	Pans
A	25	polyamide PA	stainless steel 1.4301	-
B				polymer
C	24	galvanized covered rolling bearings ZZ (on request 2RS)	galvanized steel and stainless steel 1.4301	-
D	25	galvanized covered rolling bearings ZZ (on request 2RS): - plastic outer ring - stainless steel 1.4301 inner ring	stainless steel 1.4301	-
H		polypropylene PP		polymer

25
Special steel trolleys

Elements:
Material:

trolley's body / axles - galvanized or stainless steel 1.4301
 rollers - covered rolling bearings
 bumpers - rubber EPDM

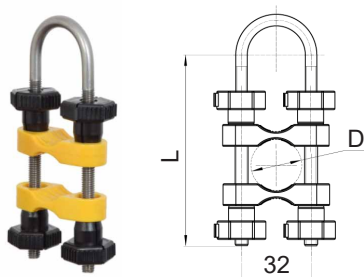
Maximum trolley speed: up to 80 m/min
 Working temperature: from -30°C to +80°C
 Maximum load WK-S1m: galvanized steel: 8 [kg]; stainless steel: 5 [kg]
 Maximum load WK-S1, WK-S1-2ZG: galvanized steel: 16 [kg]; stainless steel: 10 [kg]

Special steel trolley - galvanized steel		N- stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
1053.02	WK-S1m	1053.02-N	WK-S1m-N	0,075
1053.01	WK-S1	1053.01-N	WK-S1-N	0,170
1053.03	WK-S1-2ZG	1053.03-N	WK-S1-2ZG-N	1,180

26
Brackets with spaces pressure wires

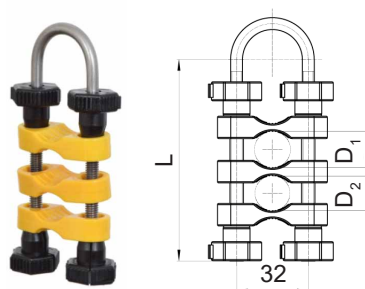
Bracket for one wire

UL-130



Bracket for two wires

UL-230



Examples:

UL-130

UL-230


Elements
Material

bracket - stainless steel 1.4301
 spaces pressure, nuts - polyamide PA

Working temperature: from -20°C to +50°C
 Maximum load: 5 [kg]

Catalog №	Type	Number of cables	Max. diameter of single cable D	Max. amount of the diameter of all the cables [mm]	Dimension L	Weight [kg]
1054.01-30	UL-130	1	8-24	-	95	0,093
1054.02-30	UL-230	2	8-24	30	95	0,094

27

Flexible filling profile



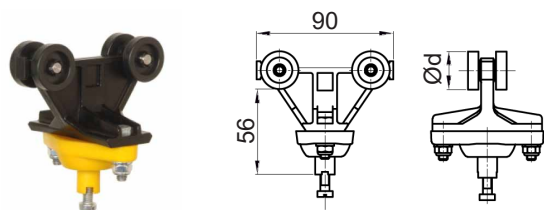
Catalog №	Type	Weight [kg]
1075.00	PRW-01	0,150

Profile is available in lengths that are multiples of 1 meter.

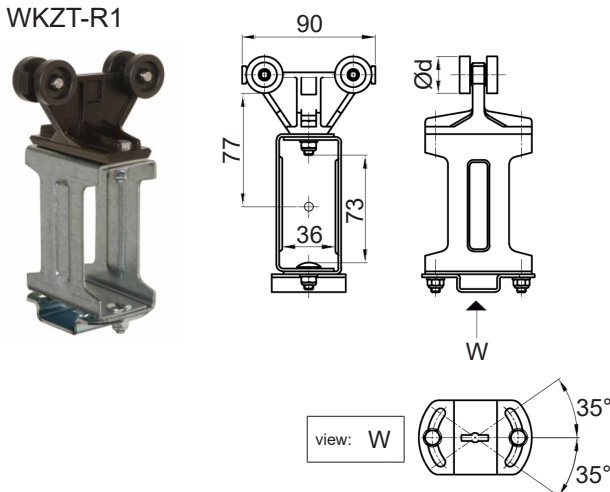
Flexible profile is designed for fill in the free space in a bunch of cables between clamping surfaces made by cable support and part of trolley or end clamp body.

The application of flexible profile provides steady pressure on the cables in case of the large difference in cross-section.

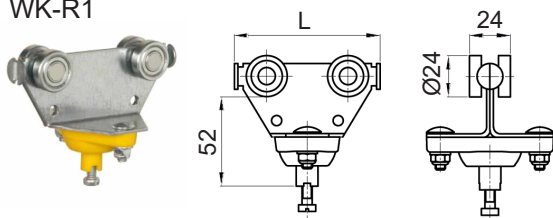
WKT-R1



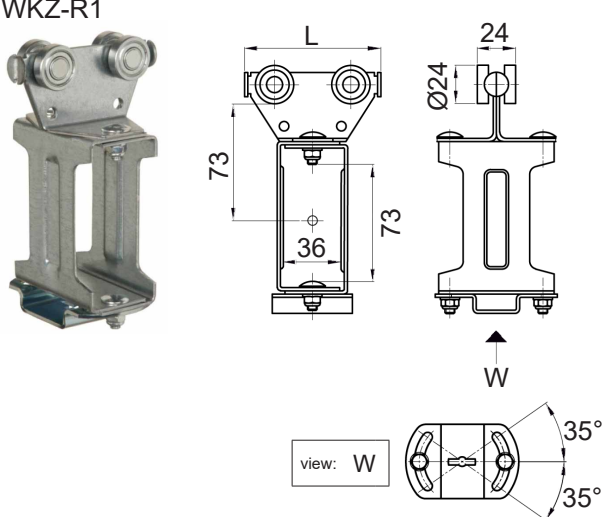
WKZT-R1



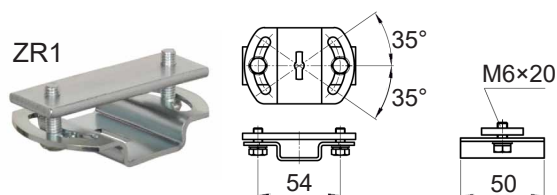
WK-R1



WKZ-R1



ZR1



Elements:

trolley's body, ball joint
clamp's body ZR1, plate
screws
nuts

Material:

- polyamide PA
- galvanized or stainless steel 1.4301
- galvanized steel (clamp ZR1) or stainless steel 1.4301
- polyamide PA, galvanized steel or stainless steel 1.4301 (clamp ZR1)

PLASTIC TROLLEYS

Maximum trolley speed:

up to 30 m/min

Working temperature:

od -20°C do +50°C

Maximum end clamp load:

galvanized steel: up to 10 [kg]; stainless steel: up to 6 [kg]

STEEL TROLLEYS

Maximum trolley speed:

up to 40 m/min

Working temperature:

from -20°C to +50°C

The appropriate cable holder for round cables type UL-1016, UL-1017 and UL-2736 should be ordered for chosen trolley with a ball joint (page 31).

Cable trolleys can be also equipped in one or two bumpers ZG-01 (page 33).

As a result, trolley length is increased by 12.5 [mm] (with one bumper) or 25 [mm] (with two bumpers).

GALVANIZED STEEL

Cable trolley WK-R1					Towing trolley WKZ-R1		
Catalog №	Type	L	Maximum load [kg]	Weight [kg]	Catalog №	Type	Weight [kg]
Plastic trolleys							
1030.01	WKT-R1 A-90	90	6	0,105	1031.01	WKZT-R1 A-90	0,415
1030.02	WKT-R1 B-90	90	6	0,105	1031.02	WKZT-R1 B-90	0,415
1030.03	WKT-R1 C-90	90	10	0,155	1031.03	WKZT-R1 C-90	0,475
1030.04	WKT-R1 D-90	90	4	0,120	1031.04	WKZT-R1 D-90	0,425
Steel trolleys							
1035.01	WK-R1-85	85	10	0,260	1036.01	WKZ-R1-85	0,580
1035.11	WK-R1-95	95	10	0,275	1036.11	WKZ-R1-95	0,590
1035.21	WK-R1-108	108	10	0,295	1036.21	WKZ-R1-108	0,615
1035.31	WK-R1-125	125	10	0,320	1036.31	WKZ-R1-125	0,635

End clamp ZR1		
Catalog №	Type	Weight [kg]
1032.00	ZR1	0,120

STAINLESS STEEL 1.4301

Cable trolley WK-R1 ...-N					Towing trolley WKZ-R1 ...-N		
Catalog №	Type	L	Maximum load [kg]	Weight [kg]	Catalog №	Type	Weight [kg]
Plastic trolleys							
1030.01-N	WKT-R1 A-90-N	90	6	0,105	1031.01-N	WKZT-R1A-90-N	0,415
1030.02-N	WKT-R1 B-90-N	90	6	0,105	1031.02-N	WKZT-R1B-90-N	0,415
1030.03-N	WKT-R1 C-90-N	90	10	0,155	1031.03-N	WKZT-R1C-90-N	0,475
1030.04-N	WKT-R1 D-90-N	90	4	0,120	1031.04-N	WKZT-R1D-90-N	0,425
Steel trolleys							
1035.01-N	WK-R1-85-N	85	6	0,260	1036.01-N	WKZ-R1-85-N	0,580
1035.11-N	WK-R1-95-N	95	6	0,275	1036.11-N	WKZ-R1-95-N	0,590
1035.21-N	WK-R1-108-N	108	6	0,295	1036.21-N	WKZ-R1-108-N	0,615
1035.31-N	WK-R1-125-N	125	6	0,320	1036.31-N	WKZ-R1-125-N	0,635

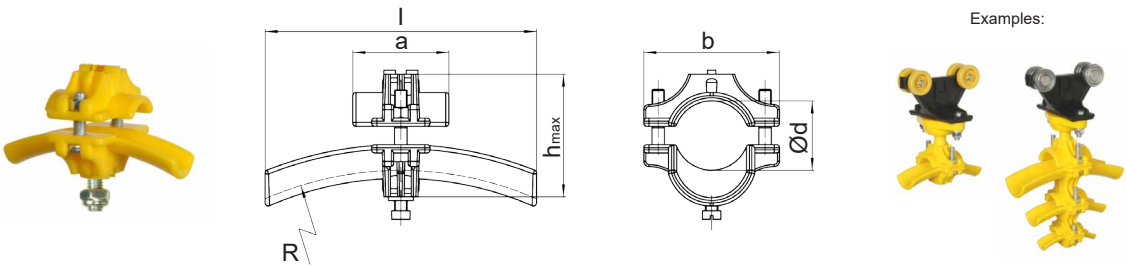
End clamp ZR1-N		
Catalog №	Type	Weight [kg]
1032.01-N	ZR1-N	0,120

Rollers:



Roller type	Ø d [mm]	MATERIAL		
		Rollers	Axle	Pans
A	25	polyamide PA	stainless steel 1.4301	-
B				polymer
C	24	galvanized covered rolling bearings ZZ (on request 2RS)	galvanized steel and stainless steel 1.4301	-
D	25	galvanized covered rolling bearings ZZ (on request 2RS): - plastic outer ring - stainless steel 1.4301 inner ring	stainless steel 1.4301	-
H		polypropylene PP		polymer

29 Cable holders for round cables



Elements: **Material:**

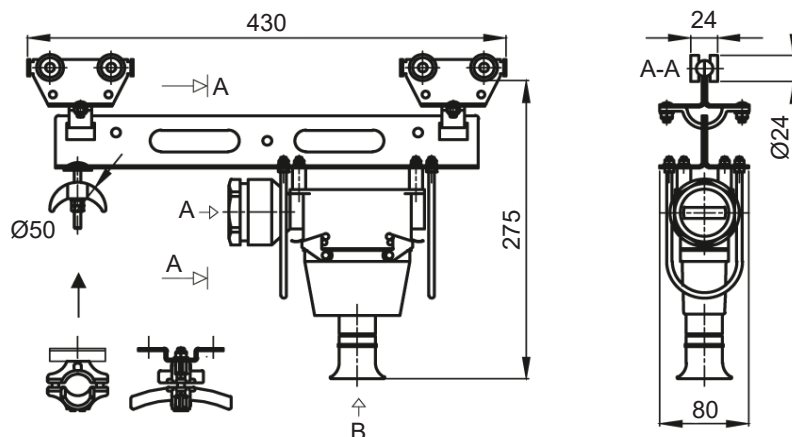
holder's body - polyamide PA
screws, nuts - galvanized or stainless steel 1.4301

Working temperature: from -20°C to +50°C
maximum end clamp's load: galvanized steel: 10 [kg]; stainless steel: do 6 [kg]

Cable holder - galvanized steel								N- stainless steel		
Catalog №	Type	a [mm]	b [mm]	l [mm]	h _{max} [mm]	Ø d [mm]	R [mm]	Catalog №	Type	Weight [kg]
1040.01	UL-1016	34,0	44,0	65,0	40,0	10-16	75	1040.01-N	UL-1016-N	0,032
1040.02	UL-1726	40,5	54,0	89,5	53,5	17-26	110	1040.02-N	UL-1726-N	0,058
1040.03	UL-2736	45,5	64,5	120,5	66,0	27-36	160	1040.03-N	UL-2736-N	0,085

30
Control unit trolleys with multipolar junction


Round cable holder UL-1726


Elements:

cable trolleys
 rollers
 cable support/cable holder, separator
 round cable holder, nuts for D50T cable supports
 płytki zacisku regulowanego, osie, śruby, nakrętki
 korpus
 multipolar junction

Material:

- galvanized steel
 - covered rolling bearings ZZ (on request 2RS)
 - polyamide PA or polypropylene PP (on request)
 - polyamide PA
 - galvanized steel
 - cold formed, Sendzimir galvanized steel PN-EN 10327
 - die-cast aluminium

Maximum trolley speed: up to 50 m/min

Working temperature: from -20°C to +80°C

Internal protection level: IP 54

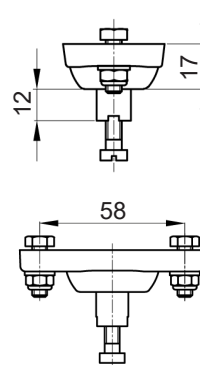
Maximum trolley load: 20 [kg]

Catalog №	Type	Festoon cable	Numbers of terminals	Gland		Weight [kg]
				A	B	
1009.15	WS-C15	flat	16+E	PG 42	PG 21	2,680
1009.16	WS-C16		24+E	PG 42	PG 29	2,880
1009.35	WS-C15A		16+E	PG 29	PG 21	2,540
1009.17	WS-C17	round	16+E	PG 29	PG 21	2,480
1009.18	WS-C18		24+E	PG 29	PG 29	2,740

Cable trolleys can be also equipped in one or two bumpers ZG-1 (page 33).

ACCESSORIES

31 Mount with ball joint MPK



Elements: Material:

body - polyamide PA
screws, nuts - galvanized or stainless steel 1.4301

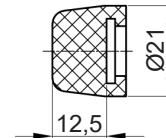
Working temperature: from -20°C to +50°C

Mount with ball joint MPK - galvanized steel			N- stainless steel 1.4301			Weight [kg]
Catalog №	Type	Max. load [kg]	Catalog №	Type	Max. load [kg]	
1041.00	MPK	10	1041.00-N	MPK-N	6	0,045

32 Bumper



Example:



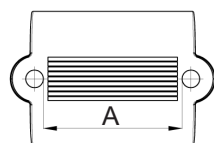
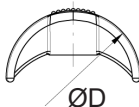
Elements: Material:

bumper - rubber EPDM

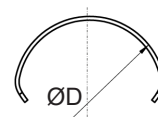
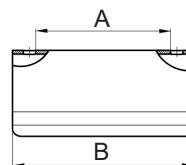
Catalog №	Type	Weight [kg]
1070.00	ZG-01	0,008

33
Plastic, steel standard and strenghtened cable supports

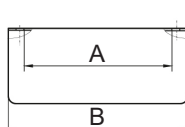
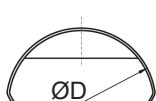
Plastic cable supports



Steel normal cable supports



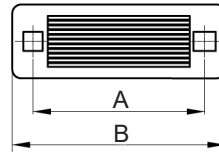
Steel strenghtened cable supports


Elements: Material:

cable support - polyamide PA / polypropylene PP / galvanized steel / stainless steel 1.4301

Catalog №	Type	Material	Dimensions [mm]			Weight [kg]
			D	A	B	
plastic cable supports						
1080.01	D50T×76-PA	polyamide PA (yellow)	50	52	76	0,023
1080.02	D50T×96-PA			72	96	0,027
1080.03	D80T×76-PA		80	52	76	0,038
1080.04	D80T×96-PA			72	96	0,047
1080.11	D50T×76-PP	polypropylene PP (grey)	50	52	76	0,023
1080.12	D50T×96-PP			72	96	0,027
1080.13	D80T×76-PP		80	52	76	0,038
1080.14	D80T×96-PP			72	96	0,047
steel cable supports - standard - galvanized steel						
1081.01	D50×76	galvanized steel	50	52	76	0,098
1081.02	D50×96		50	72	96	0,125
1081.03	D80×96		80	72	96	0,196
1081.04	D80×167		80	135	167	0,339
steel cable supports - standard - stainless steel 1.4301						
1081.01-N	D50×76-N	stainless steel 1,4301	50	52	76	0,098
1081.02-N	D50×96-N		50	72	96	0,125
1081.03-N	D80×96-N		80	72	96	0,196
1081.04-N	D80×167-N		80	135	167	0,339
steel cable supports - strenghtened - galvanized steel						
1082.02	D125×175	galvanized steel	125	135	175	0,670
1082.03	D160×175		160	135	175	0,915

The 50 and 80 [mm] polyamide PA cable supports in standard version are adapted to use with plastic nuts.
The 50 and 80 [mm] polypropylene PP cable supports in standard version are adapted to use with steel nuts.

34 Separators

Elements: Material:

separators - polyamide PA (black) or polypropylene PP (grey)

Catalog №	Type	Material	Dimensions [mm]		Weight [kg]
			A	B	
1080.20	L76-PA	polyamide PA (black)	58	71	0,004
1080.21	L96-PA		78	93	0,007
1080.25	L76-PP	polypropylene PP (grey)	58	71	0,004
1080.26	L96-PP		78	93	0,007

35 Plastic conical nuts


The plastic nuts are designed to fastening the 50 i 80 [mm] polyamide PA cable supports.

Elements: Material:

nut - polyamide PA

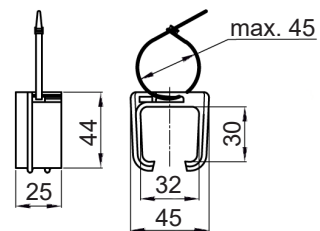
Catalog №	Type	Material	Weight [kg]
1080.30	M6-PA	polyamide PA	0,003

36 Cable mounting clips

UL-PA UL-PP



Example


Elements: Material:

clip, band clip - polyamide PA or polypropylene PP

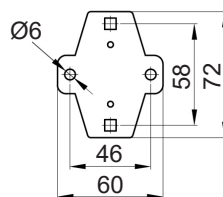
Catalog №	Type	Material	Weight [kg]
1013.11	UL-PA	polyamide PA	0,012
1013.12	UL-PP	polypropylene PP	0,012

The set includes a clip and a band clip.

 The spacing between the handles depends on the size and number of cables.
On average, they range from 300 to 450 [mm].

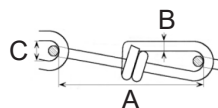
37 Mounting plate PM


Example



The plate is used in case of ties between plastic cable trolleys.

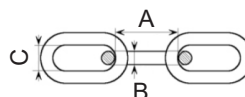
Plate - galvanized steel		N- stainless steel 1.4301		Weight [kg]
Catalog №	Type	Catalog №	Type	
5000.10	PM	5000.10-N	PM-N	0,045

38 Technical chain VICTOR DIN 5686


Elements: **Material:**

chain link - galvanized steel

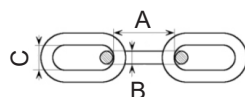
Catalog №	Type	Nominal size	Dimensions [mm]			Unit of measure	Weight [kg]
			A	B	C		
1009.24	ŁOV-2.0	2,0	28,0	2,0	5,1	1 m	0,080

39 Technical chain DIN 5685


Elements: **Material:**

chain link - galvanized steel

Catalog №	Type	Nominal size	Dimensions [mm]			Unit of measure	Weight [kg]
			A	B	C		
1009.26	ŁOK-3	3,0	16,0	3,0	6,0	1 m	0,165
1009.27	ŁOK-4	4,0	19,0	4,0	7,0		0,295

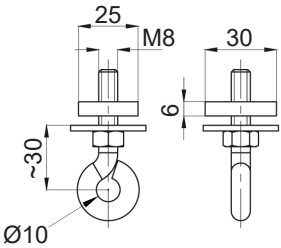
40 Technical chain DIN 766


Elements: **Material:**

chain link - stainless steel AISI 316

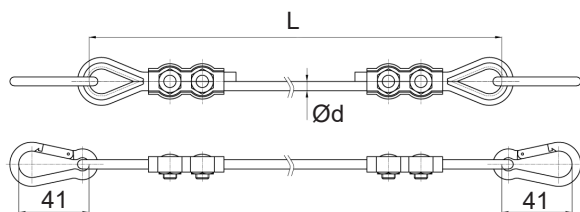
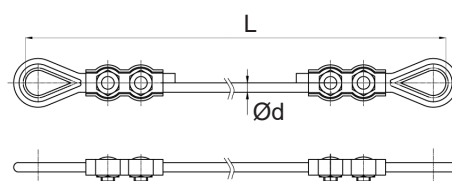
Catalog №	Type	Nominal size	Dimensions [mm]			Unit of measure	Weight [kg]
			A	B	C		
1009.26-N	ŁOK-3-N	3,0	15,7	3,0	5,0	1 m	0,170
1009.27-N	ŁOK-4-N	4,0	16,0	4,0	7,0		0,320

41	Hook eyelet
----	-------------



Elements: square nut, screw, nut, pad
Material: - galvanized or stainless steel 1.4301

Hook eyelet - galvanized steel			N- stainless steel 1.4301		Weight [kg]
Catalog №	Type	Nominal size	Nr katalogowy	Typ	
1002.27	MC10	0,070	1002.27-N	MC10-N	0,07

42 Plastic rope ties
a) with snap hooks

b) without snap hooks

Elements:

 rope
double rope clamp (ZL2-3-N), rope thimbles (K2-N), snap hook (KR2-N)

Material:

 - polyamide PA or polypropylene PP
- stainless steel AISI 316

Catalog №	Type	Material	Rope diameter d [mm]
3000.40 A	CLPP-4K-L *	polypropylene PP	4.0
3000.40 B	CLPP-4-L *		
3000.50 A	CLPP-4K-L *	polyamide PA	4,0
3000.50 B	CLPP-4-L *		

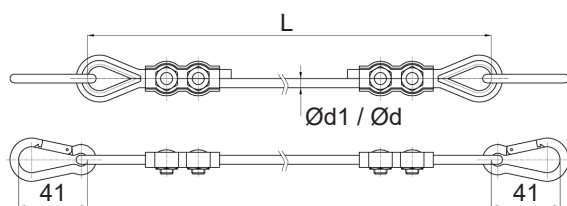
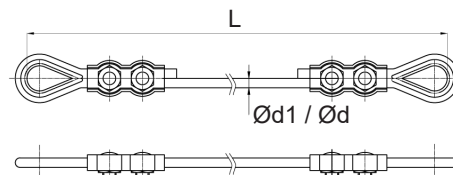
* - add length L [mm] to the designation

Polypropylene rope tie A weight $\varnothing 4$ [mm] = $0,00723$ [kg] $\times$ L [m] + $0,082$ [kg]

Polyamide rope tie A weight $\varnothing 4$ [mm] = $0,00987$ [kg] $\times$ L [m] + $0,082$ [kg]

Polypropylene rope tie B weight $\varnothing 4$ [mm] = $0,00723$ [kg] $\times$ L [m] + $0,052$ [kg]

Polyamide rope tie B weight $\varnothing 4$ [mm] = $0,00987$ [kg] $\times$ L [m] + $0,052$ [kg]

43 PVC shielded steel rope ties
a) with snap hooks

b) without snap hooks

Elements:

 rope (wg DIN3055)
double rope clamp (ZL2-3-N), rope thimbles (K2-N), snap hook (KR2-N)

Material:

 - galvanized or stainless steel AISI 316 PVC shielded
- stainless steel AISI 316

Rope tie - galvanized steel				N- stainless steel 1.4301	
Catalog №	Type	Diameter of the		Catalog №	Type
		rope - d	PVC shielded rope - d1		
3000.30A	CLS-2/3K-L *	2,0	3,0	3000.30A-N	CLS-2/3K-N-L *
3000.30B	CLS-2/3-L *			3000.30B-N	CLS-2/3-N-L *

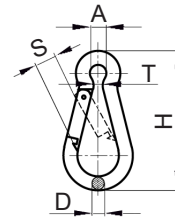
* - add length L [mm] to the designation

PVC shielded rope tie A weight made of galvanized steel - diameter $\varnothing 2 / \varnothing 3$ [mm] = $0,021$ [kg] $\times$ L [m] + $0,082$ [kg]

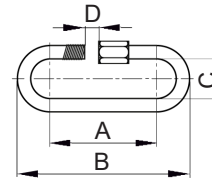
PVC shielded rope tie A weight made of stainless steel - diameter $\varnothing 2 / \varnothing 3$ [mm] = $0,023$ [kg] $\times$ L [m] + $0,082$ [kg]

PVC shielded rope tie B weight made of galvanized steel - diameter $\varnothing 2 / \varnothing 3$ [mm] = $0,021$ [kg] $\times$ L [m] + $0,052$ [kg]

PVC shielded rope tie B weight made of stainless steel - diameter $\varnothing 2 / \varnothing 3$ [mm] = $0,023$ [kg] $\times$ L [m] + $0,052$ [kg]

44 Snap hook


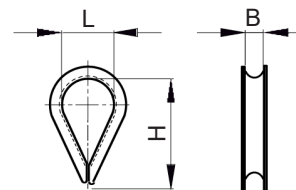
Snap hook - galvanized steel									N- stainless steel AISI 316		
Catalog №	Type	Nominal size	Max. strenght [kg]	Dimensions [mm]					Catalog №	Type	Weight [kg]
				A	B	H	S	T			
1009.21	KR1	40 × 4	80	6	4	40	6	5	1009.21 -N	KR1 -N	0,008
1009.22	KR2	50 × 5	100	8	5	51	7	6	1009.22 -N	KR2 -N	0,016

45 Twisted link

Twisted link - galvanized steel

Catalog №	Type	Nominal size	Max. strenght [kg]	Dimensions [mm]				Weight [kg]
				A	D	C	D	
1009.40	OGS 035	3,5 N	50	29	38	10	4	0,008

Twisted link - stainless steel AISI 316

1009.40 -N	OGS 035 -N	3,5 N	50	30	37	11	5	0,009
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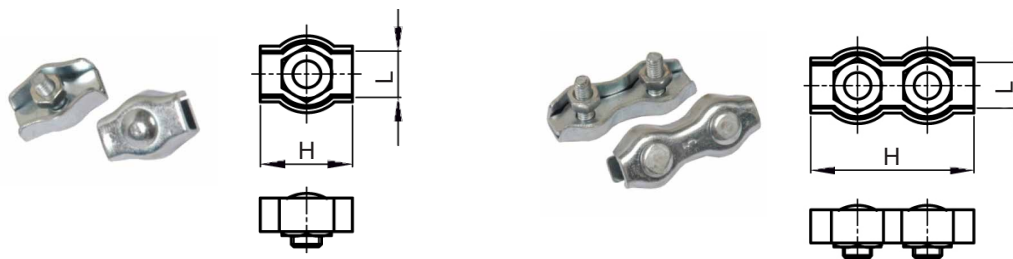
46 Rope thimble

Thimble - galvanized steel

Catalog №	Type	Nominal size	Rope Ø [mm]	Dimensions [mm]			Weight[kg]
				L	H	B	
1009.19	K1	3	2,5 - 3,0	12	19	3	0,006
1009.10	K2	4	3,0 - 4,0	13	21	4	0,009

Thimble - stainless steel AISI 316

1009.19 -N	K1 -N	3	2,5 - 3,0	11	22	3	0,002
1009.10 -N	K2 -N	4	3,0 - 4,0	13	27	4	0,005

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Rope clamps

Elements: Material:

clamp - galvanized or stainless steel AISI 316

Catalog №	Type	Nominal size	Rope Ø [mm]	Dimensions [mm]		Weight [kg]
				L	H	
Single clamp - galvanized steel						
1009.23	ZL 1	2	1,8 - 2,0	5	16	0,006
Double clamp - galvanized steel						
1009.20	ZL2-2	2	1,8 - 2,0	5	30	0,011
1009.80	ZL2-3	3	2,0 - 3,0	7	36	0,013
Double clamp - stainless steel AISI 316						
1009.20 -N	ZL2-3N	3	2,0 - 3,0	7	35	0,013

CABLES

48

Cables for crane industry - general information

UNILIFT has got a wide offer of festoon cables made by leading producers. These cables are mainly applied in: festoon systems, cable reels, energy guiding chains, etc.

Festoon systems consist flat cables characterized by flexibility and very low curve radius. They're able to be bundled – what gives reduction of festoon's size.

UNILIFT has got a wide offer of festoon cables made by leading producers. Below is the list of typical cables.

Festoon systems consist round cables characterized by flexibility and very low curve radius. Here are the main types of flat cables (insulation PUR and rubber, shielded or unshielded):

- H05VVH6-F
- H07VVH6-F
- YFLY, KYFLY
- YCFLY, YFCLY, KYCFLY, KYFLCY (EMV)
- NGFLGÖU UL
- M(StD)HÖU UL (EMC)
- LSOH

Festoon systems consist round cables characterized by flexibility and very low curve radius. Here are the main types of flat cables (insulation PUR and rubber, shielded or unshielded):

- FESTOONTEC PUR-HF
- FESTOONTEC C-PUR-HF
- REELTEC PUR-HF
- REELTEC (K) NSHTÖU, REELTEC (K) (N) SHTÖU
- REELTEC KSM-(N)SHTSÖU-J, REELTEC KSM-(N)SHTSÖU-J+LWL
- SPREADERFLEX 3GSLTOE-J
- H07RN-F, H07RN-F PREMIUM
- ÖPVC-JZ/OZ, ÖPVC-JZ/OZ-YCY

For energy guiding chains the most commonly used cables are:

- REELTEC PUR-HF
- REELTEC (K) NSHTÖU, REELTEC (K) (N) SHTÖU
- REELTEC KSM-(N)SHTSÖU-J, REELTEC KSM-(N)SHTSÖU-J+LWL

Cable for connect the control stations with crane or conveyor devices, hoists, etc. equipped with two integral steel strings:

- FYMYTW
- KASTER

CABLE GLANDS

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Cable glands - general information

UNILIFT has to offer a wide assortment of cable glands for cables pointed above.

Cable glands types:

- plastic PG and metric for flat and round cables,
- nickel plated brass PG and metric for flat cables,
- special glands,
- universal glands.

More information is contained in our catalog:

„Electrical cables for cranes, elevators and conveyor systems”.

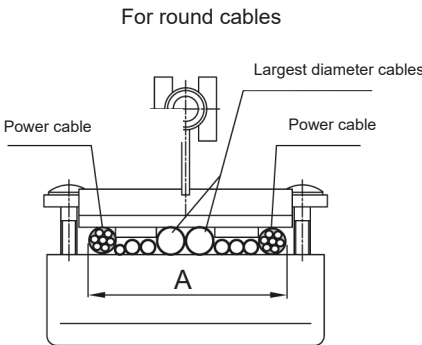
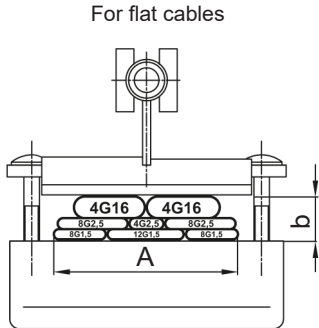


INSTRUKCTIONS AND FORMS

50

Design tips

a) Cable arrangement on cable support:



b) Cable trolleys selection:

Approximate weight of cables for one trolley:

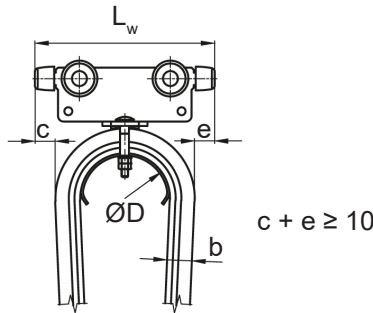
$$F_{kW} = 2 \times h \times G_k \text{ [kg]}$$

Designations	
G_k	weight of 1 meter of cable bunch [kg/m]
h	cable loop height [m]

c) Length and width of cable trolleys for flat cables:

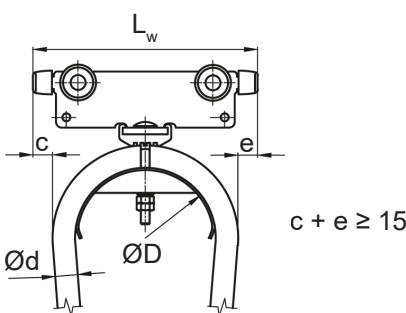
For flat cables

$$L_w = \varnothing D + 2b + 10 \text{ [mm]}$$



For round cables

$$L_w = \varnothing D + 2d_{\max} + 15 \text{ [mm]}$$



Designations	
L_w	approximate cable length [mm]
b	flat cable bunch thickness [m]
$d_{\max}$	cable diameter [mm]
$\varnothing D$	cable support diameter [mm]

d) Cable length addition coefficient in festoon system:

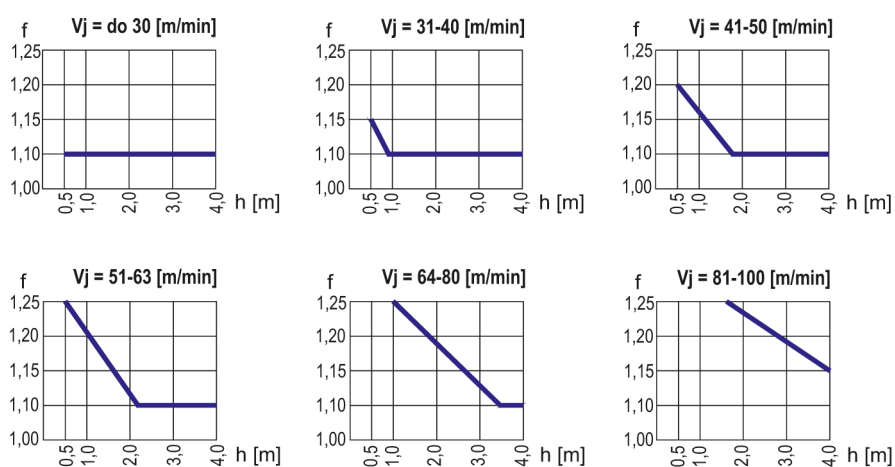
$$L = f \times (s + m) \text{ [m]}$$

Cable length in festoon system (look: page)

Designations

L	approximate cable length [mm]
s	towing trolley route length [mm]
m	trolleys storage area length [mm]
f	cable length addition coefficient

For calculate festoon's cable length coefficient "f" should be considered. Coefficient value depends on working conditions, trolleys speed, height of cable bunch, track shape, etc.



a) C-rail track assembly:

1. C-rails (for power supply line or control line) should be mounted parallel to receiver's guideway at such a distance that can ensure avoiding collision between moving trolley parts and stationary construction even with swinging cables caused by wind, etc.
2. C-rail track size, supporting structure and distance between track supports should be selected according to overall load (weight of trolleys, cables and rails) and other important working conditions.
3. C-rails can be mounted in many ways. Generally rails are fastened by support arms:
 - to receiver's guideway (I-beam or other) by girder clips
 - to supporting structure by welded support arm brackets
 - to supporting structure, wall, etc. by bolt (screw)-fastened support arm brackets
 - directly to supporting structure, ceiling, etc. by track support brackets
 Another important requirement is to ensure perpendicularity between support arm and C-rail track.
4. Installation of C-rail should be proceed very precisely, paying attention on C-rail sections connection by track couplers. Slip the sections from the both sides of the coupler, so the edges should stick together in the center of the hole placed on the coupler's side wall. The edges of the sections can't have any burrs or irregularities.
5. Using four screws on the top wall of track coupler, secure the rails protecting them from slipping out during operation.
6. Mount the end bumper at the end of the track from powered device side. In case of control festoon attach end bumpers on the opposite ends of the track.

b) Cable trolleys:

All types of cable trolleys are completely assembled by UNILIFT.

Supply line elements: cable trolleys, towing trolley and end clamp should be placed on the C-rail in the following order:

1. Towing trolley – from the powered device.
2. Trolleys – between end clamp and towing trolley.
3. End clamp – at the end of trolleys storage area.

c) Cables:

Wires should be placed and tightened on cable supports in a way that prevents bursting strands and isolation if necessary using additional relief ties. Ties should be sufficiently shorter than the maximum distance between the trolleys. Overhang between cable trolleys should be evenly distributed and only if necessary can be varied.

d) Wiring harness insulated clamps:

At each cable loop, properly matched clamping frame must be installed:

- loop height up to 2 m – 1 clamp recommended,
- loop height above 2 m – 2 clamps recommended.

The cables should be arranged in insulated clamps for flat cables according following rules:

- the largest cross section cables should be placed in upper space of a clamp, without possibility to move
- other cables are placed at the lower space of a clamp and are able to move freely.

e) Relief rope ties:

If necessary, use relief ties fixing them between trolleys and clamp.

a) Cable festoon assembly preparation:

1. Prepare the cable/cables with the calculated length (formulas – page 2 of this catalog) taking into account the connecting sections from towing trolley to terminal box in powered device and from end clamp to terminal box on crane's supporting structure.
2. Measure and mark on the cables position of the towing trolley, other trolleys and end clamp for power festoon and/or control unit trolleys, other trolleys and end clamp for control festoon.
3. Place the wires on the cable supports paying attention to their symmetrical arrangement relative to the body of trolleys/clamps.

b) Cable festoon pre-assembly:

UNILIFT can provide pre-assembled cable festoon on a special supporting structure.

During the installation of festoon to the device, follow the rules of safety. Assemble should be carry out in such a way to don't cause any damage.

c) Trolleys' test drive:

The correctness of trolleys' movement along the entire length of the track must be checked after assembly, before start to use the festoon. Pay attention to the connection of rail sections and other important places.

d) Inspection and maintenance of supply line:

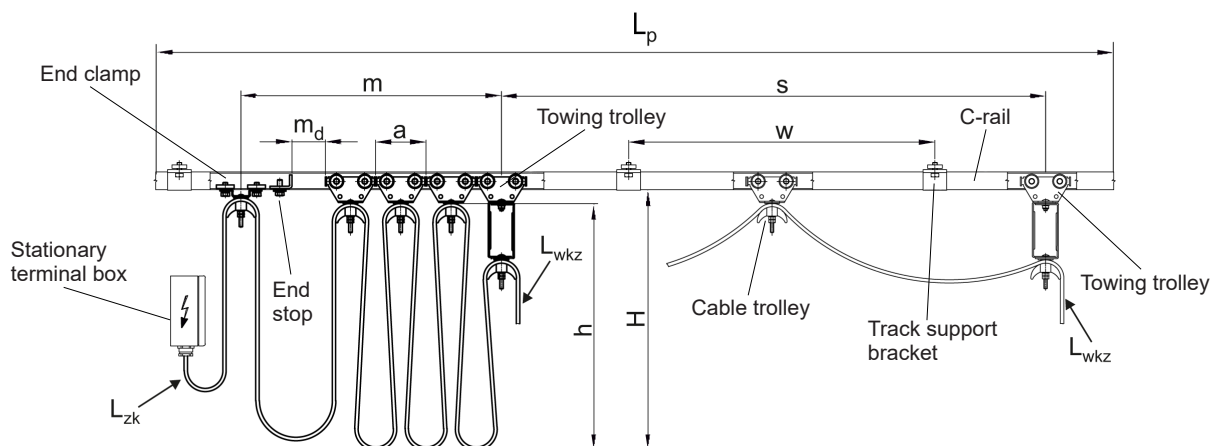
Inspections of all elements of the supply line should be carried out within a period not longer than 3 months.

Inspection range:

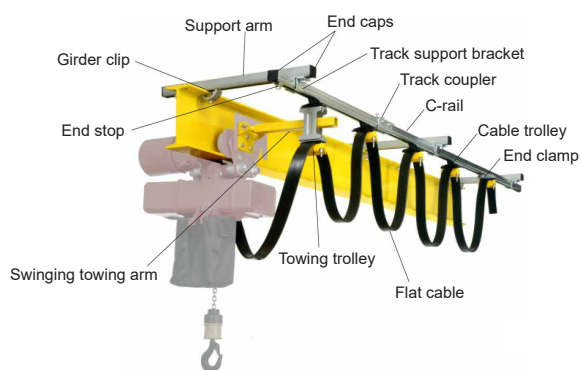
1. Monitoring of cable trolleys' bearings.
2. Checking of the rail sections connection.
3. Checking the correctness of the towing arm placement for the entire length of the supply line.
4. Checking the cable fastening on trolleys and clamps.

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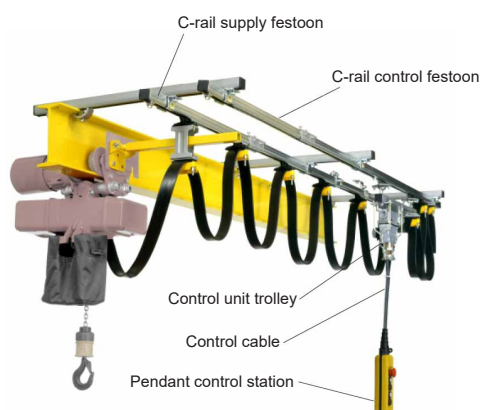
C-rail power supply system selection



a) power festoon



b) control festoon



1. Type of powered device, e.g. gantry, crane, etc.:

2. Device localization:

indoor ☐

outdoor ☐

maritime climate ☐

3. Environment:

normal ☐

dust ☐ , description

potentially explosive area ☐ , description

chemically aggressive ☐ , description

4. Temperature range:

min. °C

max. °C

5. Time of trolleys acceleration to rated speed: s

6. Length of the track of the guide C-rail L_p = m

7. Permissible height of cable loop: h = m

8. Dopuszczalna szerokość wózka: B = mm

9. Trolleys speed: m/min

10. Permissible trolleys storage area length $m =$ m

11. Cable length from towing clamp to mobile terminal box:

 $L_{wkz} =$ m

12. Cable length from end clamp to stationary terminal box:

 $L_{zk} =$ m

13. Cable type:

 electric cable ☐

 other (e.g. for gas or liquid) ☐

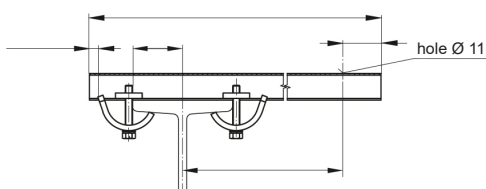
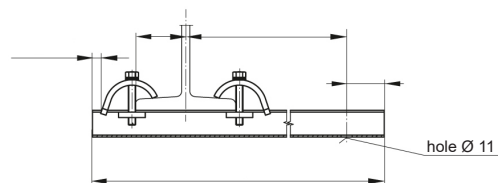
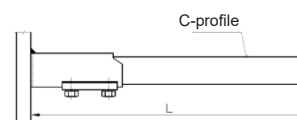
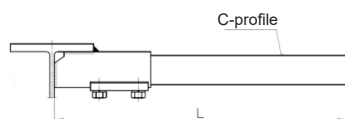
14.

Cables of the power festoon and (or) control festoon

Cable type - isolation							Cable dimension (e.g. 4G 2,5; 12G 1,5)	Supply festoon	Control festoon	Amount of cables in one mounting point (on one cable support)	Diameter $\varnothing d$ of a round cable [mm] or flat cable cross section $A \times b$
Flat	Round	PVC	Rubber	PVC shielded	Rubber shielded	Other					

 15. Support arm length: mm

16. Support arm fastening by girder clips:

 a) on higher shelf ☐

 b) on lower ☐

 17. Support arm fastening in KK-C11 bracket: ☐

 18. Support arm fastening in KK-C11P bracket: ☐


19. Contact data:

Company name	
Address	
Contact person	
Office	
Phone number	
e-mail	
date	

CABLE TROLLEYS AND ACCESSORIES FOR C1 (C1A) RAILS

